DOCUMENT RESUME

ED 052 078 SO 001 266

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TITLE	On Conflict: A Curriculum Unit with Comments.
INSTITUTION	Diablo Valley Education Project, Berkeley, Calif.; New York Friends Group, Inc., New York. Center for War/Peace Studies.
PUB DATE	70
NOTE	91p.; Pre-Publication Copy
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Cognitive Objectives, Concept Teaching, *Conflict, Conflict Resolution, Curriculum Guides, Experimental Curriculum, *Foreign Relations, *Human Relations, Nationalism, Secondary Grades, Simulation, *Social Studies Units, Values, Violence, World Affairs, *World Problems
IDENTIFIERS	Arms Control, Controversial Issues, Futurology, Peace, Revolution, War

ABSTRACT

This experimental eight week unit is designed to give students a more detailed understanding of the concepts and realities of conflict, violence, war, and international behavior than is usually done with the ordinary piecemeal textbook approach to human interaction. After trial classroom use, it was determined that the activity may be used in whole or in part, integrated into existing curriculum, in courses such as civics, United States history, world history, western civilization, area studies, international relations, anthropology, sociology, or psychology. Operation within the cognitive domain is intended with the last sub-unit on understanding of real-world situations having an impact upon the students affective domain. The other sub-units are: 1) dilemma, introduction of the ideas of ambiguity, paradox, and personality differences; 2) Cycles in Violence; 3) Behavior of Escalation; 4) Theory of Revolution; 5) Measures of Stability, nation-state stability, the modernization process, impact of revolution; 6) Economic Aid and Political Stability; 7) Arms and Insecurity; 8) Impact of Nuclear War; 10) Planning for the Future, measures of probability and study of future events; and, 11) The Inter-Nation Simulation. Some resource materials are included in each sub-unit. For further information see SO 001 259 through SO 001 267. (Author/SBE)

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ON CONFLICT:
A CURRICULUM UNIT

SO 001 266

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ON CONFLICT

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TEACHERS' GUIDE

The curriculum unit "On Conflict" is designed to give students a more detailed understanding of conflict, violence, war and inter-state behaviour than is usually done with the ordinary piecemeal textbook approach. We find, in the schools, very little treatment of war or conflict as a general phenomena. This is, especially in this era, regrettable, if one assumes that education is meant to give the young citizen the tools to understand, and to eventually take part in, human interaction.

The unit here described is, of necessity, experimental. We not only welcome, but actively seek, comments on its use, validity, flaws, applicability, acceptance by students, and theoretical structure.

We have designed this activity to be used in whole or in part. It may be used as a unit, or as a series of sub-units integrated into the existing curriculum. We believe that it could be used in courses such as Civics, United States History, World History, Western Civilization, Area Studies, International Relations, Sociology, or Psychology. It is hoped that the activity, as a whole, will operate in the cognitive domain; the culminating sub-unit (see below) is designed to have an impact upon the students' affective domain.

Tentatively, here is an outline of the scope of the unit as it is presently structured:

Sub-unit	Objective
Dilemma (Prisoner's Dilemma, Defense Minister's Dilemma, Students and Principal)	To enable the student to begin to see dilemma, paradox, and polarization; introduction of the idea of learning to live with ambiguity. Decision-making. Threat, aggression, perception and misperception, strategy, choice, interaction, "lock-in" or escalation, cooperation, conflict, and a germ of the idea of personality differences are some of the areas that are touched upon. We may begin to illustrate arguments, lovers' quarrels, rumbles, riots, strikes, arms races, wars and various other forms of conflicts.
Cycles in violence	To investigate the idea of cycles of warlike recurrence; to induce student investigation of possible causes; to raise the possibility that violent cycles, like depression cycles, may be controllable.

Behavior of escalation	To discover the self-generating war dynamic, the general form of war, some realities of the possibility of termination in particular wars. The domestic violence parallel with foreign wars.
Theory of Revolution	To discover the typology and characteristics of revolution. The revolutionary gap theory.
Measures of stability	To enable the student to discover differing levels of nation-state stability in the modern world, some meanings of the modernization process, and the impact of the revolution of rising frustrations.
Economic aid and Political Instability	To discover the frustrating paradox of aid triggering short-run internal violence.
Arms and Insecurity	To discover the self-stimulating mechanistic processes of arms races. War fever and immunity. The organic cycle of war and peace.
1914 and 1962	To find parallels between the escalation of 1914 into the First World War and the controlled situation of the Cuban Missile Crisis.
Impact of nuclear war	To point up the necessity for careful thought on the uses for and costs to civilization of modern war.
Planning for the future	To enable the student to discover the limits to the study of future events, and the possibility that some possibilities can be foreseen. Measures of probability.
An Inter-Nation Simulation	To enable the student to manipulate material which he has "learned" in a simulated-world simulation. This is the essential part of the curriculum unit, both a learning device and an evaluative tool.
Summary/Debriefing	To integrate the affective sub-unit into an understanding of real-world situations.

RESULTS OF TRIAL CLASSROOM USE

After development of this unit, it was used, in whole or in part, in nineteen classes at San Ramon Valley High School, Danville, California, under the supervision of five different teachers. While we yet lack a rigorous evaluative instrument, we found tentatively that the unit as a whole was instrumental in developing a more detailed understanding of conflict as it relates to war on the part of a majority of the students tested. Certainly it increased student interest in our social studies courses to a marked degree -- beyond what we had expected, as a matter of fact. Some comments on each sub-unit might be useful:

Dilemma. Use of the "Dilemma" simulations got the classes off to a good start. We used both the flash-card technique and a simple electronic device: both engendered much student interest, the latter method somewhat more than the former because of the slightly greater dramatic effect. Students quickly showed that they perceived the concepts being illustrated by the device; since the method had the superficial aspect of a game, it was overwhelmingly accepted. Many of the principles to be conveyed by other units can be introduced at this stage, and we found that we could return to this method later in the unit with no loss of teaching effectiveness.

Cycles in violence. Since this sub-unit used the discovery approach, we found that it, too, was highly successful. The revelation that human beings acted cyclically produced much controversy in the classes, which was easily exploitable. Some students went to great pains on their own to try to prove or disprove this hypothesis.

Behavior of escalation. Again apparently because of the approach, and the novel point of view of this sub-unit, this activity had a solid impact on a great many students. Because it dealt with up-to-date information, it was received by many as being very relevant. Then, too, a number of students indicated that fresh data, not yet included in the textbooks, appealed to the "now-centered" instincts of their "generation". The unfamiliarity of the type of charts used was easily overcome, and a good deal of discussion was prompted. Again, many felt that such regularly measurable human activity was uncanny, not to say implausible, and some undertook to prove or disprove the thesis. What more, we began to feel, could classroom teachers hope for in their courses?

Revolution and instability. This unit was fairly successful. We felt, however, that we hadn't discovered the most useful approach -- these were given by the lecture method -- and have therefore left them out of this draft guide. The sub-unit on political instability is approached backhandedly in the present "Summary" sub-unit, topic 2a.

Arms and insecurity. This served as a change of pace in technique; in some classes, we reinforced some of the concepts by using the "Dilemma" technique again. Written evaluation question responses indicated a high degree of understanding of the process. We were very pleased with the results.

1914 and 1962. Student response was positive here, since many could see the immediate application of the preceding material to this sub-unit. Many also indicated that they appreciated the up-to-date character of the research. A number of students responded that they felt this sub-unit would be relevant to their needs.

Impact of nuclear war. This sub-unit was shattering to many students; for all of the talk of the bomb, and seemingly indicated fears, very few students at the beginning of the sub-unit had more than a hazy knowledge of the problems faced by humanity because of nuclear power. While some, at the conclusion of the activity, voiced the wish that such weapons did not exist, virtually none of our students were uninterested. Expecially effective were the visual aids used in explaining the problem. Evaluation showed that this was a very effective unit.

Planning for the future. This sub-unit caught the fancy of many, for they felt that -- at last! -- social studies might be a relevant subject. Evaluation of the small-group activities indicated that many were able to synthesize the concepts they had learned in previous sub-units. The Hayden reading provoked a number of stimulating class discussions.

The Simulation. While this is discussed more fully in the sub-unit explanation later, it should be noted here that the simulation was the high point of the entire unit. Observation by the teachers indicated a high degree of behavior obviously indicating that many of the concepts learned cognitively were being retained and used. It should not be surprising to note that the two most positive responses were the "dilemma" and the simulation, since these actively involved the students.

Summary. The new material presented here to serve as the vehicle for the summary also provoked much thought and valuable classroom discussion.

There is, of course, always the danger that we may claim too much for various curriculum ideas. Yet, keeping this in mind, we felt that the unit as a whole was a most effective one, easy to integrate into a wide number of classes (American History, World Problems, Seminar on War and Peace, Cultural Anthropology, in our cases; each of the World Problems courses had differing content approaches, in addition). We found that we could tailor the unit to the needs of individual courses and classes easily. While all of the courses mentioned used some parts of the unit, only a few used them all.

Taken as a whole, then, we felt that the unit was effective and successful. We would invite comments on the unit from any teachers who use, or propose to use, parts of the activity.

SCHEDULE OF TIME ALLOTTED TO THE TEACHING OF SUBUNITS

Dilemma	3-5 days. Debriefing may be concurrent.
Cycles in violence	1 day. Discussion necessary.
Behavior of escalation	1-3 days. Discussion necessary.
Theory of revolution	2-3 days.
Measures of stability	1 day.
Economic aid and political instability	1 day.
Arms and insecurity	1 day.
1914 and 1962	1-2 days for the reading assignment
Impact of nuclear war	1-3 days, depending on student reaction.
Planning for the future	1-5 days, depending on student reaction and use of enrichment materials
Inter-Nation Simulation	5 weeks (1 week introduction; 3 week playing period -- may be shortened to nine-day session; 1 week debriefing absolutely essential)
Summary	1-3 days.

Eight weeks is the total elapsed teaching time necessary for proper implementation of the unit as presently envisaged; however, many of the subunits might easily be included in the normal course curriculum -- as an example, integrated into the United States History curriculum:

subunit	possible areas of inclusion
Dilemma	introduction to the course; any of the American wars; strikes, rebellions, other conflictual situations.
Cycles in violence	any war; compare with business or depression cycles
Behavior of escalation	Civil War, World Wars I, II; Korea; Vietnam
Theory of revolution	Glorious Revolution; American War for Independence; Civil War
Measures of stability	Post-French and Indian War period; Confederation; pre-Civil War; 1960's
Economic aid	Any period since 1919
Arms and insecurity	any war; 1930's; 1950's; 1960's
1914 and 1962	pre-World War I; 1960's
Impact of nuclear war	post-World War II
Planning for the future	present

SUGGESTED PROCEDURES FOR SUBUNIT: THE PRISONER'S DILEMMA

Distribute the form entitled "The Prisoner's Dilemma". Allow students to study it as homework or for at least five minutes in class. It is essential that they read carefully the initial situation. The teacher should go over the form prior to the playing of the game.

This game can be played in a number of different ways. For instance, we have built an electronic device to add some drama to the game. The wiring diagram for this very simple device is included in this subunit. However, most teachers will probably find it just as easy to use flash cards. Therefore, we suggest the preparation of the following cards on 9" x 12" sheets of cardboard: two sheets labelled CONFESS in large letters; two sheets labelled KEEP SILENT in large letters.

The classroom should be set up so that there will be two desks in the front of the room facing the class, with a barrier between them so that the participants cannot see each other. The teacher should reproduce the diagrams shown on the handout on the chalkboard or on an overhead projector transparency. If the two participants are seated in desks that face each other so that they may see the class and the chalkboard or the screen, they too will be able to see the outcome of the interaction.

This game may be played in a wide variety of combinations. For instance, there are four different types of communication: none whatever between the prisoners, prior communication, reversible decisions, and the non-simultaneous decision. Each of these variations will be discussed later. There are three different types of orientation, also: the participants may be instructed to be cooperative, or they may be instructed to be competitive, or as is usually the case, they may be told to be themselves -- to operate in this situation as if they were faced with a similar real life decision. The normal beginning style of playing "Prisoner's Dilemma" is that of no communication and the individualistic approach.

This lesson, then, is in the nature of an experiment -- an historical lab session, if you will. Its major value lies in the possibility of investigating various outcomes and patterns. For that reason, the class will find it indispensable to keep a record of what transpires. A detailed experimental record form for the teacher is included. The use of an experimental record is obvious: only after playing this simulation a number of times will patterns begin to emerge that will be meaningful to the students.

At this stage the game may be played. As the teacher asks each participant to make his decision, the participant will raise a large lettered flash card of his choice, either to confess or to keep silent. Only when both have indicated their choice will the teacher point to the outcome on the chalkboard or the screen. At this point, both the participants and the class will write down an indication of the choice made and the outcome in years. It is of course important that the participants especially keep a running record of their years in jail. Once the outcomes are indicated, the teacher will ask the participants to make another decision. It is suggested that the teacher remind the students occasionally to keep in mind all that has occurred previously in the game. A minimum of five or six interactions is necessary before patterns begin to emerge. There is of course no upper limit to the number of interactions possible. It may be that in some cases -- such as hostile-hostile choices, or mutually cooperative choices, five or six interactions may be the optimum. On the other hand, if we find two participants who are not locked in to either hostility or cooperation, 15 to 30 interactions may be useful.

The following are some of the possible patterns that may begin to emerge. Experience will indicate that these are just a few of the many possibilities. First of all, the cooperative choice -- that is, the choice of both not to confess -- is clearly seen. This position may indicate mutual trust, or it may indicate mutual realization of the optimum strategy. Continued cooperative choice may in some instances increase the tension between the participants. This possibility, and many of the other possibilities that arise, should be elicited in the debriefing held after each pair of participants interacts. It should be noted that the cooperative mode may involve what is tantamount to a lock-in -- that is, continued interaction may lessen the tendency to make any other choice. The lock-in, or deadlock, may be better seen, however, in the mutually hostile choice -- where both confess. Realization of the predicament involved in such joint choice may cause the participants to fear an attempt to break out of deadlock -- especially since such extrication will necessarily involve a risk on the part of the player who attempts it. Thus, the deadlock. In the debriefing, a number of real life parallels to such a situation may be pointed out: the argument, in which neither party is willing to back down; the arms race, wherein both parties fear they cannot safely de-escalate. It should be noted that this choice, too -- that is, hostility -- may be made either for defensive or aggressive reasons. It may be fruitful to point out that the effect of either the defensive or aggressive modes is precisely the same. It should also be noted that this may be responsible for many of the wars humanity has had -- that both sides felt they were being defensive, and that this defensive pattern served as a threat to the other party -- a threat which eventuated in the use of force. The instructor will want to elicit the idea of threat. The threatening situation will almost inevitably develop in response to the interaction. This example of the concept of threat should be discussed. Students should be brought to understand that the mere fact of threat virtually has to lead to hostility.

The other two strategy choices are easily seen. If one confesses, or turns state's evidence, the other will react in one of two predictable ways: he will either realize that defense is necessary in the future, in which case confession will be his choice, or he will attempt revenge, in which case confession is also inevitable the following time. If, then, one participant "burns" the other, the latter will react by confessing. The realization of what he has done and of what his partner must necessarily do in the next interaction will lead the injuring party also to confess. Hence, we are back to the deadlock. It is at this point that the teacher will be able to point out what effect one's own actions will have on others, and that one's own actions, affecting others, will narrow one's options, too, in the future.

Extrication from a deadlock is very difficult. Participants will find that they can only withdraw from a deadlock by taking the risk of being injured. In the debriefing, the teacher will want to point out this very real aspect of human interaction -- that it is easier to remain in the hostile mode than to risk one's face, or self-image, by attempting to get out of the hostile situation.

Alternate methods of communication include prior communication, wherein we assume the prisoners have made a previously agreed-upon strategy bargain; this may be simulated by allowing the participants to go in the hall for a couple of minutes and make a deal. Insight will indicate that prior communication is a rather risky business, and this will become clear if this mode is used once or twice in the classroom. Reversible decision is a situation in which a period of time -- 15 to 30 seconds, for instance -- may be allowed to the participants to change their choices. Reversible decision is an interesting method of inquiry in which any number of things might happen. It is well worth a try or two and analysis of the results. Non-simultaneous decisions are those in which one participant makes a decision which is communicated to the class and to the other participant, who then makes his move. This is illustrative of the action-reaction syndrome. It will quickly be seen that an initial hostile reaction almost inevitably results in a hostile deadlock, and that an initial trusting or cooperative decision will usually result in cooperation, at least for the short run. This latter technique, that of non-simultaneous decision-making, is so forceful that the use of it more than twice may well result in classroom boredom.

Alternate orientations include predetermined cooperation or previously specified competition. Again, these two are so clear and unequivocal that their use quickly palls, in that when both participants are told to be cooperative, they will lock into the cooperative strategy, and when both are told to be competitive, they will quickly deadlock in the hostile mode. Any combination of communication and orientation is, of course, possible.

Student participation in the debriefing should be encouraged. Experience seems to show that students very quickly sense the emergent patterns and can offer reasons for them; in fact, it is most illuminating to ask non-participants to evaluate what, and especially why, the participants did as they did. The most significant question will be "why"? With some use of this subunit's technique, many of the concepts regarding human interaction can be illustrated and investigated, including the following:

action and reaction
trust and mistrust
perception and misperception (much of what takes place in this
    game, as in life, will be predicated on the frames of reference
    of the players, and will be subject to bias and misperception)
threat
aggression and defense
choice and strategy
something of the process of decision-making
cooperative and conflictual interaction
escalation and de-escalation
the deadlock and the problem of extrication
something of the effect of personality differences

The imaginative teacher, watching a number of these interactions, will be able to discern many if not all of the above concepts. The teacher will want also to encourage students to discover real-world parallels with these concepts. Imagination, insight, and some hard thought will provide the teacher with many parallels to these ideas.

There are two main objections to the use of the "Prisoner's Dilemma". One is that it raises a question of unethical conduct, in that we suggest that students might consider not confessing to a crime of which they are guilty. The second is that it makes use of the same situation over and over again, which might become somewhat stultifying after a long period of time, although experience has shown that this is a negligible consideration. The teacher might want to vary the type of dilemma game used; we include also the handout for the dilemma entitled "Students and Principal," a perhaps more student-relevant simulation, in reality the same sort of non-zero-sum two-person game, though the situation is very different from "Prisoner's Dilemma". It should be noted that the payoffs matrix for this version is not in numerical terms; as a matter of fact, one may wish to vary the payoffs to investigate whether or not the outcomes will have a strong impact on the decision made. Still another possibility for variation is the game entitled "Government's Dilemma", also included, a game which again is very similar to the basic "Prisoner's Dilemma" theory. All of these games, and other variations, have been thoroughly tested in high school classrooms, and have been found to be very useful -- and even fun.

The objective of this initial subunit has been to interest students in investigating some of the psychological concepts involved in conflict. At this point, if the teacher is satisfied with the class reaction to the subunit, he should continue on to the next subunit.

DILEMMA

PRISONER'S DILEMMA

THE SITUATION: Two suspects are questioned separately by the District Attorney. They are guilty of the crime of which they are suspected, but the D.A. does not have sufficient evidence to convict either. The state has, however, sufficient evidence to convict both of a lesser offense. The alternatives open to the suspects are to confess or not to confess to the serious crime. They are separated and cannot communicate with each other. The outcomes are as follows:

> If BOTH confess, both get severe sentences, which are, however, somewhat reduced because of the confession.
>
> > If ONE confesses (turns state's evidence), the other gets the book thrown at him, and the informer goes scot free.
>
> If NEITHER confesses, they cannot be convicted of the serious crime, but will surely be tried and convicted for the lesser offense.

THE PROBLEM: Which strategy should I choose? What will my fellow prisoner do, and how will it affect my choice?

SPECIAL CONSIDERATIONS: Certain special considerations which will affect your choice of a course of action may be given by the instructor.

COURSES OF ACTION: The Grey Box -- choosing a strategy. Each participant has a small grey box in front of him. If he chooses to CONFESS, he throws the switch to the LEFT. If he chooses NOT TO CONFESS, he throws the switch to the RIGHT.

the "ROW" player	
1 confess	2 don't confess

the "COLUMN" player	
1A confess	2 don't confess

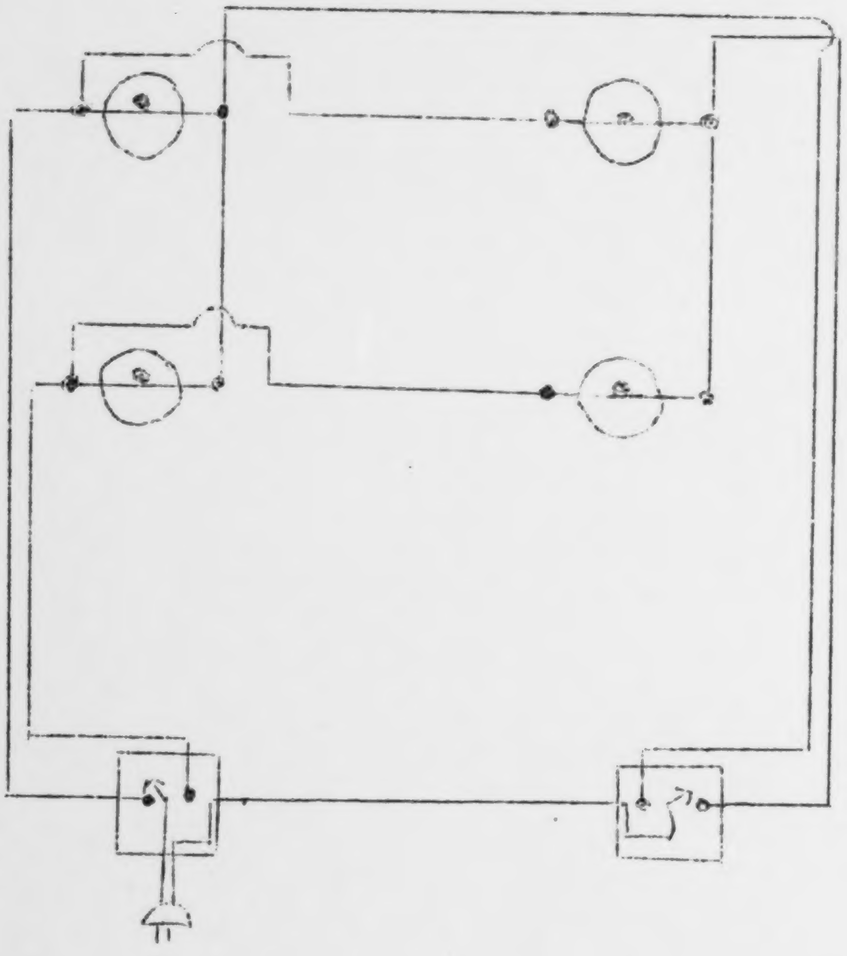
DECISION: The Payoffs Matrix -- results. Numbers are years in jail. "ROW" is the lower-left-hand number, "Colum" the upper-right-hand number.

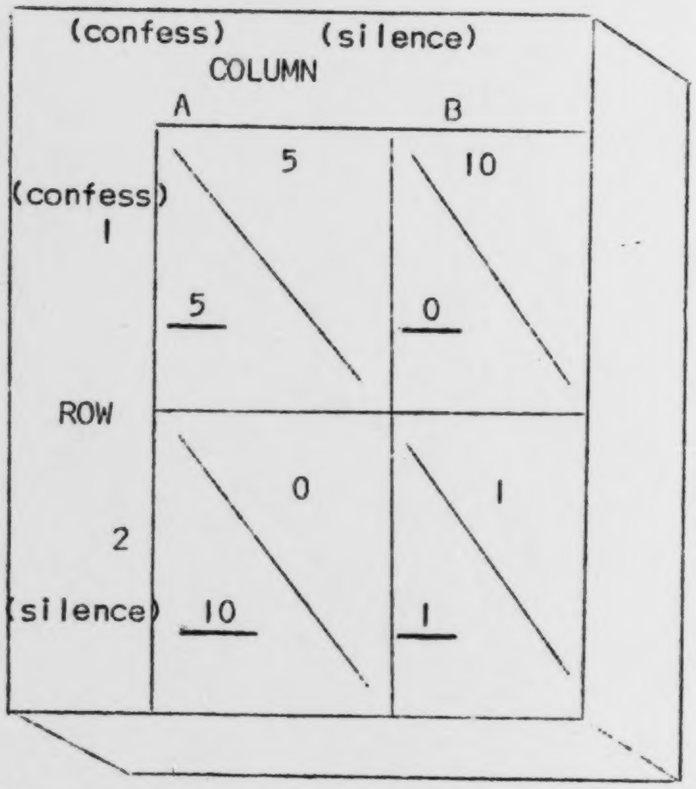
ROW		confess A	don't confess B
confess	1	5 5	10 0
don't confess	2	0 10	1 1

COLUMN

DILEMMA

wiring diagram

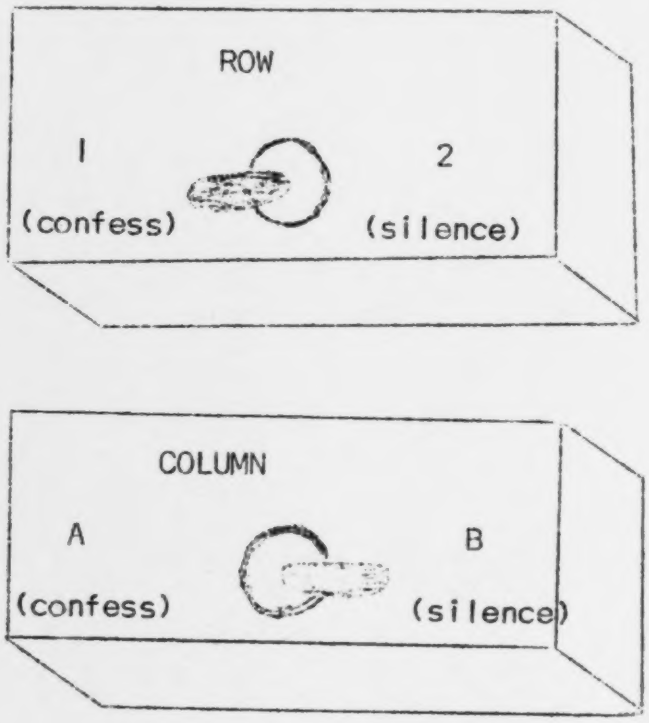




		COLUMN A (confess)	COLUMN B (silence)
ROW	1 (confess)	5 5	10 0
ROW	2 (silence)	0 10	1 1

The light box, with payoffs matrix
Row's payoffs, lower left, are underlined

The "grey-boxes" - for making the decision



ROW
1
(confess)
2
(silence)
COLUMN
A
(confess)
B
(silence)

ROW		sex	age	grade
COLUMN				

C, confess ☐ OTHER:
D, don't confess
☐ PF ☐ DMD ☐ SD

COMMUNICATION: ○ none ○ prior ○ reversible decision ○ nonsimultaneous dec'n

ORIENTATION: ○ co-operative ○ individualist ○ competitive

ROW		sex	age	grade
COLUMN				

TYPE: ☐ PD ☐ DMD ☐ SD
☐ OTHER:

COMMO: ○ none ○ prior ○ revble dec'n ○ nonsimltns dec'n

ORIENTN: ○ Co-op ○ Indivistic ○ Compet

ROW		sex	age	grade
COLUMN				

TYPE: ☐ PD ☐ DMD ☐ SD
☐ OTHER:

COMMO: ○ none ○ prior ○ revble dec'n ○ nonsimltns dec'n

ORIENTN: ○ Co-op ○ Indiv. ○ Compet.

ROW		sex	age	grade
COLUMN				

TYPE: ☐ PD ☐ DMD ☐ SD
☐ OTHER:

COMMO: ○ none ○ prior ○ revble dec'n ○ nonsimltns dec'n

ORIENTN: ○ Co-op ○ Indiv. ○ Compet.

ROW		sex	age	grade
COLUMN				

TYPE: ☐ PD ☐ DMD ☐ SD
☐ OTHER:

COMMO: ○ none ○ prior ○ revble dec'n ○ nonsimltns dec'n

ORIENTN: ○ Co-op ○ Indiv. ○ Compet.

ROW		sex	age	grade
COLUMN				

TYPE: ☐ PD ☐ DMD ☐ SD
☐ OTHER:

COMMO: ○ none ○ prior ○ revble dec'n ○ nonsimltns dec'n

ORIENTN: ○ Co-op ○ Indiv. ○ Compet.

DILEMMA

STUDENTS AND PRINCIPAL

THE INITIAL SITUATION: The place is S. O. Ristrie High School; the time is now. The characters in this dilemma are Miss Ida Phlunctem, Principal, and a group of concerned students. As the initial situation develops, we see the Principal suspending a male student for wearing long hair. Immediately there is an uproar, with students, faculty, administration and community taking sides: some claim that the principal is right, and that boys ought to wear their hair short; others, that she is right, but should have expelled the boy; still others agree on the short hair, but think the punishment is too severe; some think she is wrong, and that the hair issue is not the school's concern; and so on. Be that as it may, a group of students thinks about calling on the principal, asking that she reconsider the suspension and ask the Student Council and Faculty Senate to reconsider the regulations about hair length.

THE PROBLEM: There are many possible ways out of this dilemma. We have recently seen similar issues on many high school and college campuses. For the purposes of an exercise in decision-making and understanding the consequences of action and interaction, we are limiting the choices of each participant to two:

To refuse to negotiate with the other participant; or

To discuss the situation in good faith.

Let's put this in chart form.

		PRINCIPAL	
		Refuse to negotiate with students; use force if necessary, including local police.	To discuss the problem with the students.
STUDENTS	Refuse to negotiate with principal; student demonstrations	−10 −10	0 5
	Discuss the problem with the principal	+5 0	10 10

ANALYSES AND COMPARISON. At this point, each participant will want to think carefully of the possible outcomes of their actions. For isntance, if both refuse to discuss the problem, both lose points; if both discuss the problem, both gain points. If the students are willing to discuss the problem but the principal calls for the aid of the police, the principal "wins" by showing forceful action (but the students do not lose any prestige points). If the principal is willing to negotiate but the students start a demonstration, the students "win" because they have shown the community that the principal cannot control the situation in the school.

Of course, the problem doesn't stop there; we have to live with ourselves and with others day after day, problem after problem. So, we'll want to consider future actions and future consequences. Therefore, think carefully before making your decision.

DECISION. The instructor will give you a few minutes to consider your decision. On the form provided, check your decision and write down the reasons (be as specific as you can) for your decision.

On the DILEMMA decision-making devices -- the grey boxes -- throw the switch to the LEFT to refuse to negotiate, and to the RIGHT to discuss the issues.

After your decision has been made, go on to the second situation.

THE POINT OF "DILEMMA": The point of this exercise was NOT to resolve, or solve, each situation; we can't do that adequately with this type of simulation -- after all, we only gave each participant two choices of action, not the many which we would consider in real life. As a matter of fact, we didn't solve any of these situations -- we just awarded you "prestige points" for the way you went about solving, or coming to grips with, these problems.

And that's the point: how do we confront new situations? Does the way we face a new problem have anything to do with how we solve it? In the long run, are you more likely to settle a problem to your satisfaction, more or less, if you NEGOTIATE or REFUST TO NEGOTIATE with any others concerned in that problem?

You should also note that we weren't concerned with the merits of each situation. This exercise was not centered on the "rightness" or "wrongness" of long hair, or the justice of ethnic studies programs, or anything else; those are very complicated situations that we'll take up later, in a more appropriate way. Again, the point today was the method of human interaction, not solutions to particular issues.

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SECOND SITUATION

GIRLS AT THE SCHOOL WANT THE PRIVILEGE OF WEARING SLACKS AND PANTS TO SCHOOL. THE PRINCIPAL IS OPPOSED TO THIS.

THIRD SITUATION

S. O. FISTRIE HIGH HAS A CLOSED CAMPUS. THE STUDENTS WANT AN OPEN CAMPUS. THE PRINCIPAL DOESN'T.

FOURTH SITUATION

FISTRIE HIGH USED TO HAVE A HOT LUNCH COUNTER. SOME TIME BACK THEY INSTALLED A "FOOD-O-MAT". THERE HAVE BEEN MANY COMPLAINTS: COLD FOOD, NO CHANGE, JAMMED MACHINES, STALE CUISINE. THEY WANT THE LUNCH LINE BACK. THE PRINCIPAL DOESN'T: THE SCHOOL CAN'T AFFORD THE ADDITIONAL COST.

FIFTH SITUATION

THIRTY PERCENT OF THE STUDENTS ARE SCOTTISH, AND WANT HAGGIS SERVED AT LUNCH. (HAGGIS IS A PUDDING MADE OF THE HEART, LIVER, LUNGS, ETC., OF A SHEEP OR A CALF, MINCED WITH SUET, ONIONS, OATMEAL, ETC., SEASONED, AND BOILED IN THE STOMACH OF THE ANIMAL.) THE PRINCIPAL IS OOPOSED, BECAUSE OF THE INCREASED COST OF SERVING SPECIAL FOOD TO MINORITY GROUPS.

SIXTH SITUATION

THE SCOTTISH STUDENTS WANT AN ETHNIC STUDIES PROGRAM (COURSES ON CALEDONIAN HISTORY AND THE GAELIC LANGUAGE), AND THEY WANT IT NOW. THE PRINCIPAL IS OPPOSED: THERE ISN'T ENOUGH MONEY.

SEVENTH SITUATION

SOME STUDENTS WANT TO BE ABLE TO EAT LUNCH IN THEIR CARS IN THE PARKING LOT. THE PRINCIPAL THINKS THIS IS UNWISE.

EIGHTH SITUATION

THE "STUDENT SCOTTISH RIGHTS COMMITTEE" WANTS TO HAVE A GREEN HIBERNIAN FROM THE FOURTH WORLD LIBERATION FRONT TO SPEAK ON CAMPUS. THE PRINCIPAL IS UNEASY ABOUT THE CONSEQUENCES.

NINTH SITUATION

THE PRINCIPAL WANTS FLEXIBLE, ROTATING OR MODULAR SCHEDULING. THE STUDENTS ARE HAPPY THE WAY THINGS ARE NOW.

TENTH SITUATION

THE PRINCIPAL WANTS REGULATIONS FOR SKIRT LENGTH. THE STUDENTS ARE OPPOSED TO THE IDEA.

DILEMMA

THE GOVERNMENT'S DILEMMA

THE SITUATION: Two nations, HILARIA and CONFUSIA, confront each other across a common border. They are now engaged in negotiations, but their past relations have sometimes been uneasy. Their task: to decide how to react to each other in crisis situations. They must, of course, take into account what their opponents will do -- and act accordingly. The initial situation that they face is that each fears the other might launch a surprise "preventive-war" attack.

> THE PROBLEM: Which strategy shall I, as a government leader, choose? What will my opponent do? What do the people of my country want? Are their wishes paramount to my own judgments? Will I remain as President or lose my job?

SPECIAL CONSIDERATIONS: The class will be divided into two parts. Each part will decide upon a president, and will try to instruct him how to act in times of cirsis. Each country may decide how to organize politically to carry out these aims -- they may decide, for instance, to have a one-party state with a Political Leader who will decide when the president is not doing his job (that is, is not being responsive to the wishes of the party), and who will replace the old leader with a new president. Or the country may decide to have no political leader -- a democracy without parties. Or, possibly the people would like to have two parties -- the "ins" sending their leader to the seat of government, and the "outs" hoping to replace him with their own president, if he doesn't respond to, or carry out, the wishes of the people satisfactorily. Remember, the method chosen is the will of the people -- it's your country. Also, please note that one of the major problems will be to decide how to find out what public opinion wants, and how to respond.

COURSES OF ACTION: Each government has two choices:

To continue negotiations; or

To launch an attack on the other

Let's put this in chart form, showing the payoffs, or results:

		CONFUSIA	
		launch an attack	continue negotiations
HILARIA	launch an attack	- 15 billion -$5 billion	- $2 billion + $1 billion
	continue negotiations	+ $1 billion - $2 billion	+ $2 billion + $2 billion

The Government's Dilemma

ANALYSIS AND COMPARISON. At this point, each participant will want to think carefully of the possible outcomes of their actions. For instance, if both continue to negotiate, both continue to collect taxes from their citizens, it being peacetime and productive. If both launch attacks, both lose $5 billion. If one launches an attack while the other is negotiating, the unprepared side loses $2 billion through destruction (only partial, of course) while the other gains $1 billion (probably through reparations; possibly because of captured territory).

Of course, the problem doesn't stop there; we have to live with ourselves and with others day after day, crisis after crisis. So, we'll want to consider future actions and future consequences. Therefore, think carefully before making your decision.

DECISION. The instructor will give you a few minutes to consider your decision. Be sure that you keep track of what is happening, adding to or subtracting from the amount of money that you started with in the treasury.

On the DILEMMA decision-making devices -- the greay boxes -- throw the switch to the LEFT if you want to launch an attack, and to the RIGHT if you choose to continue to negotiate peacefully.

THIS NATION IS ______________________________

THIS NATION BEGAN WITH $__________ BILLION IN ITS TREASURY.

FURTHER SITUATIONS FOR THE GOVERNMENT'S DILEMMA

1 INFORMATION HAS BEEN RECEIVED BY THE HILARIAN C.I.A. THAT CONFUSIA IS CONSIDERING LULLING HILARIA INTO A PEACEFUL POSTURE, AND THEN LAUNCHING A DEVASTATING SURPRISE ATTACK.

2 CONFUSIAN EXILES HAVE BEEN OPERATING FROM A SECRET BASE IN HILARIA, TRYING TO TOPPLE THE PRESENT CONFUSIAN REGIME.

3 RUMORS ARE BEING HEARD THAT THE HILARIAN CHIEF OF STATE IS GRAVELY ILL, AND THAT HE MAY BE DYING. THE GOVERNMENT REFUSES TO CONFIRM THIS OR TO DENY IT.

4 THE STOCK MARKET IN MYOPIA, THE CONFUSIAN CAPITAL, HAS BEEN SLIPPING BADLY. IS PEACE IN DANGER OF BREAKING OUT, OR IS CONFUSIA FACING A MAJOR DEPRESSION?

5 HILARIAN GOVERNMENT OFFICIALS, FEARFUL OF A POSSIBLE WAR WITH CONFUSIA, HAVE BEEN ATTEMPTING TO GET THEIR CITIZENS TO BUILD FALLOUT SHELTERS. HILARIA MAINTAINS THAT THIS IS JUSTIFIABLE AS A DEFENSE MEASURE, BUT CONFUSIA FEELS THAT IT MAY INDICATE ACTUAL HILARIAN AGGRESSIVE PLANS.

6 THE CONFUSIAN MINISTER OF PRODUCTION HAS TAKEN UNDER ADVISEMENT A PROPOSAL TO NATIONALIZE THE OIL INDUSTRY. SINCE MUCH INVESTMENT IN THAT INDUSTRY COMES FROM HILARIAN STOCKHOLDERS, THE HILARIAN BUSINESS COMMUNITY HAS BEEN PRESSING ITS GOVERNMENT FOR A STRONG STAND.

7 HILARIA MAINTAINS THAT THE UNITED NATIONS IS UNDER THE CONTROL OF THE CONFUSIAN GOVERNMENT, AND IS REFUSING TO PAY THIS YEAR'S CONTRIBUTION TO THAT BODY.

8 CONFUSIA HAS RECEIVED SOME INDICATIONS THAT HILRIA MAY BE FALLING UNDER THE INFLUENCE OF CHINESE COMMUNISM.

9 THE EUPHORIA SENTINEL, OFFICIAL GOVERNMENT NEWSPAPER OF HILARIA, HAS JUST CHARGED THAT A CONFUSIAN "SPY PLANE" HAS INVADED HILARIAN AIRSPACE, AND HAS BEEN DOWNED BY A SURFACE-TO-AIR MISSILE.

10 HILARIA HAS JUST SEIZED A CONFUSIAN FISHING VESSEL, CHARGING IT WITH FISHING WITHIN THE HILARIAN 200 MILE LIMIT.

11 SOME CONFUSIAN SAILORS, ON LEAVE FROM THEIR GUNBOAT IN A HILARIAN PORT, HAVE BEEN ARRESTED AND CHARGED WITH RIOTING AFTER VISITING A HILARIAN SALOON, AND DESECRATING THE HILARIAN FLAG.

12 CONFUSIA HAS REFUSED TO ALLOW ANY PLANES TO LAND IN ITS TERRITORY WHICH HAVE LANDED IN, OR FLOWN OVER, HILARIA.

13 THE HILARIAN SENATE HAS JUST APPROVED THE EXPENDITURE OF 50 BILLION RASBUCKNIKS WITH WHICH TO BUILD AN ANTI-CHINESE ANTI-BALLISTIC-MISSILE SYSTEM. CONFUSIAN OFFICIALS FEEL THAT THIS SYSTEM IS IN REALITY DIRECTED AGAINST THEM, AND INDICATES A WORSENING OF THE HILARIA-CONFUSIA COLD WAR.

14 THE CONFUSIAN PARLIAMENT LAST WEEK APPROVED, IN SECRET SESSION, 5 MILLION PESETAS FOR DEVELOPMENT OF A DEADLY WAR GAS, IT WAS LEARNED TODAY BY A USUALLY RELIABLE SOURCE.

15 ALL TELEPHONE, TELEGRAPH AND MAIL SERVICE BETWEEN HILARIA AND CONFUSIA HAS BEEN SEVERED. ALL ROADS ARE CLOSED, AND TRAINS ARE NOT PERMITTED TO CROSS THE BORDERS. OUTSIDE OBSERVERS ARE WORRIED THAT THIS INDICATES HOSTILE ACTIVITY, BUT NEWS SOURCES ARE UNABLE TO PROVIDE DEFINITE INFORMATION.

16 A HILARIAN NAVAL VESSEL, PATROLLING A RIVER IN NEUTRAL CONVIVIA, HAS BEEN ATTACKED AND SUNK BY AIRCRAFT BEARING THE MARKINGS OF THE CONFUSIAN AIR FORCE. CONFUSIA ADMITS THE ATTACK, BUT CLAIMS THAT THE VESSEL FIRED ON THEIR PLANES FIRST AND ANYWAY THEIR PILOTS WERE CONFUSED AND THOUGHT THAT IT WAS A CONVIVIAN SHIP. THEY HAVE ANNOUNCED THAT THEY WILL APOLOGIZE BUT WILL CERTAINLY NOT PAY DAMAGES.

SUGGESTED PROCEDURES FOR SUBUNIT: CYCLES IN VIOLENCE

Distribute form entitled "The Occurrence of War". Allow students to study it as homework or for at least 30 minutes in class. It is essential that they have definite meanings for each item in the vocabulary section, especially the difference between conflict and violence. One of the learning objectives is the discovery that conflict is ever-present in human life, but that its manifestations may be controlled -- that it need not become violent. The teacher may wish to point out that any form of competition, even games, is conflictual; business is a form of controlled conflict; discussions often center around, and disagreements always reflect, conflict. In most of these situations, however, we agree overtly or tacitly on basic rules, and violence is not a normative outcome of the conflict. In sports, and usually in business, we agree to disagree; we congratulate the winner, and any show of violence is considered bad form. This will be a recurrent theme throughout the unit, and we may assume that some students will discover this during this particular subunit.

The teacher should refrain from hinting at the fact that we are discussing cyclic occurrences of war: this is to be discovered by the student. We have meticulously avoided any terms that would indicate repetition or cyclic phenomena in the form.

The data are from Frank H. Denton and Warren Phillips, "Some Patterns in the History of Violence," Journal of Conflict Resolution, XII #2, (June, 1968), 182-195. Denton and Phillips have used data provided by the specialist on international relations Quincy Wright, who, at the University of Chicago, began in 1926 the research project which finally led to the publication of his monumental A Study of War in 1942 (A Study of War, 2 volumes, Chicago, University of Chicago Press, 1942; second edition, 2 volumes in 1, Chicago, University of Chicago Press, 1965). In the chart given by Denton and Phillips, the "average amount of violence" is an index number of the number of wars, casualties, and troops involved, from 1820 to 1949. Data are given for five-year periods.

An explanation of the meaning of the term "index number" might be wise at this point. In fact, the teacher might show the students how to create index numbers -- perhaps by illustrating the computation of grade point averages. It might be useful to mention other indices -- the Dow Jones or New York Times stock market indexes, or the cost of living, or the like.

It will be apparent that there seems to be a recurrence of wars every fifth period, or twenty-five years. The teacher should keep in mind that we are here dealing with world-wide phenomena, not just that involving the United States. For that reason, in case some students should ask, it might be well to be cognizant of some of these lesser-known (at least to most Americans) of international conflicts:

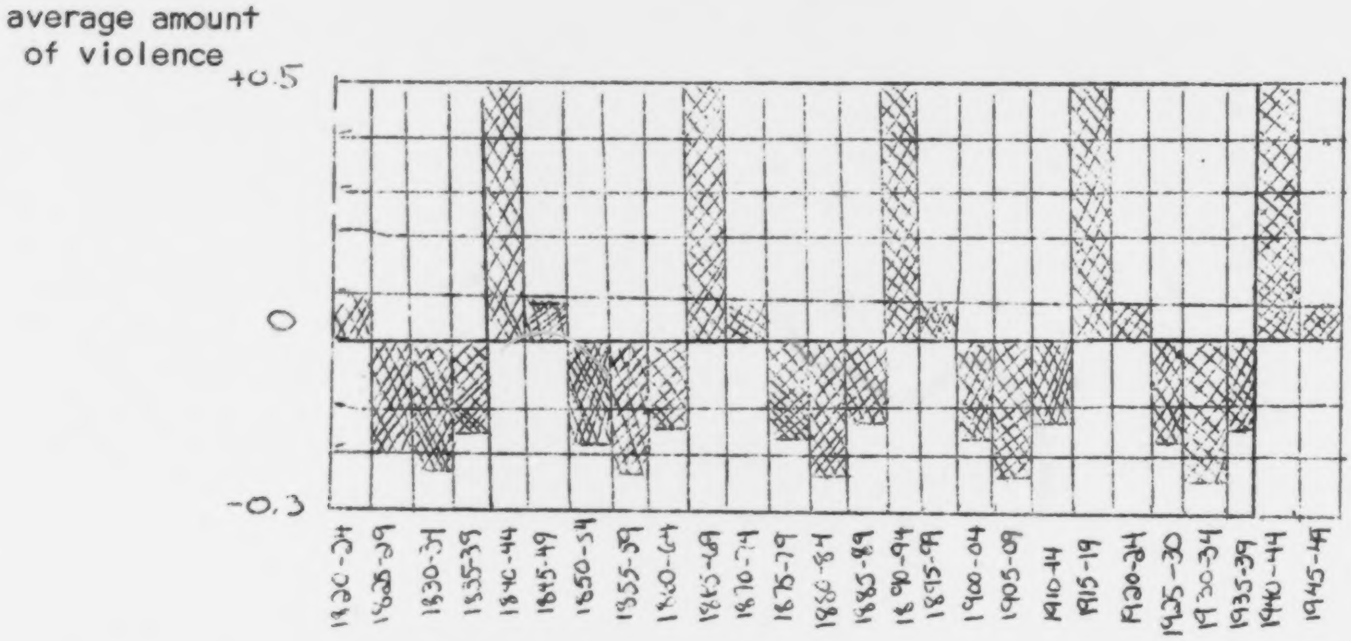
war	dates
Latin-American Revolutions	1810-24
Spanish Civil War	1821-23
Greek Revolt	1821-30
Algerian conquest	1830-47
Khivan conquest	1839-42
Peru-Bolivia	1835-42
2nd La Plata War	1839-52

Bear in mind that we mention only a few. Wright lists some 133 since 1820.

ON CONFLICT

THE OCCURRENCE OF WAR

The chart below gives an "index number" of the average amount of violence in the world for the years 1820 to 1949. These numbers are a combination of the number of wars, casualties, and troops involved, and are averaged over the 130-year period.



VOCABULARY. Be sure that you know the precise meaning of:

precise conflict violence casualty index number

QUESTIONS. Give some careful thought to these ideas:

1. What do you see after thoughtful study of this chart? (If you see a pattern, go on to question 3; if you don't try question 2.)
2. Try rearranging the chart in your imagination. Notice anything about every fifth bar?
3. Do you have any off-the-cuff ideas about what this indicates?
4. Offhand, why do you think this should happen?
5. What importance does this chart seem to have? What does it say about the future?

Ist Opium War	1840-42
Japanese Restoration	1863-69
Mexican Expedition	1862-67
Great War in La Plata*	1865-70
Austro-Prussian	1866
Spanish Civil War	1866-68
Cretan Revolt	1866-69
Cuban Revolt	1868-78
Sino-Japanese	1894-95

*Also known as the Lopez War or the Wars of the Triple Alliance. Lewis Richardson (Statistics of Deadly Quarrels, Pittsburgh, Boxwood Press, 1960), in a work little-known by the general public but highly respected by students of war, notes that it caused more casualties than the American Civil War.

Again, we have mentioned only a few of the wars fought during the period, in case students should question the validity of the Denton-Phillips hypothesis. Those seriously skeptical -- a trait that should be encouraged, not dampened, by the teacher in the course of these exercises -- should be induced to search for casualty figures. Suggested sources would be the Richardson or Wright works.

It is a folk-cliche that "major wars occur once every generation." Variations on this theme are rife: "every generation must have its own war." Some students should be encouraged to search out similar statements.

After study of this chart, students should be induced to answer question 3, to submit ideas on what the chart indicates; simply enough it is the pattern of cyclic recurrence. After the teacher is satisfied that all members of the class have discovered this idea, question 4 should be attempted, that is, the reasons for cycles. One might present other indications of cycles -- business cycles, for instance, or depression cycles. Weather cycles, seasons, sleeping, and food-habit cycles are all examples of this type of phenomena. Students should be induced to provide examples such as these. Question 4 is pretty open-ended: the conversation or discussion should not be directed too much by the teacher. Typical statements might include the idea of satiation with war, followed by war-weariness, with that in turn followed by the maturation of a new generation which has not known war, and has been raised to consider wars part of the glorious heritage of their particular nation and hence be prepared to accept a new war. This line of thought will be picked up later (in the arms and insecurity subunit).

Question 5 is the most important of the series. Students should be encouraged to theorize about the importance of the chart. Some will quickly grasp the point that it indicates future occurrence of predictable warlike activity (in fact, space has been provided on the chart if they wish to do some figuring). Some students will be quick to point out that, all other things being equal, the world should see a massive war on the scale of World Wars I and II in the period 1965-69, if these data have any predictive value. Interested students should be motivated to evaluate post-1949 data in order to discover whether or not the cycle is still continuing as in the chart. (They may conclude that even the Vietnamese wars, up to March 1969, do not justify this conclusion.) This, in turn, should lead to other fruitful lines of investigation: why should the cycle have been broken? Is it due to the discovery of nuclear fission as a destructive weapon? Has the world finally realized the peril of nuclear warfare? Is it sheer accident, fate, kismet? Some students may begin to realize that cycles of war, like the depression cycle, can be controlled by some sort of human action -- and this would be the most significant learning result of the exercise.

The teacher may want the class to write out answers to various of the questions, to be kept in a notebook for reference later, in the course of the unit. However, discussion should not be eliminated, for it is precisely at this point that real learning may be precipitated. Nor should the teacher feel it necessary to conclude this subunit in a single day, if students should find the course of the discussion interesting.

There are some useful offshoots to the main course of study. It might be helpful to point out to the students the basic ethnocentrism of human society -- for example, how many knew of the occurrence of the Lopez War? How many knowledgeable adults can be found who have even heard of it? What does this indicate about our society? What implications has it for the next generation? How does this insularity restrict our leadership in the modern world?

Then, too, the teacher might wish to mention that we shall be dealing with the study of the future in a later subunit. One might wish to investigate the relevance of history to the present and the future. Can history be forgotten? Discounted? Are we controlled by it? Influenced by it? To what extent? Why? What is history? Can we ignore it? If we do, is there a penalty? What?

For the more philosophically or theologically oriented, this may provide some food for thought: Is the course of the future preordained? Does man have free will, or is he acting out some predetermined pattern of events? How can we tell?

For those who are interested, a challenging question might be: What sort of human action might bring war under control? Is it feasible to think along these lines, or must we mutely accept a major war as inevitable? What are the obstacles to the control of war? If war can be controlled, can it be eliminated? What are the examples history provides for the control of war? Could we still maintain our democratic way of life in a world in which war was controlled or eliminated?

Most of these lines of thought will lead the student, sooner or later, to a very basic question: What is war? Why is it used? How is it useful? Is it always useful? When is it used? Misused? What effect has it on technology? What effect has technology on war? Has the character or usefulness of war changed in history?

Some discussions may develop along the following lines: Would we still have conflict without war? Is violence inevitable? What are the results of violence? Has violence any utility? If so, what? Should violence be outlawed? Why or why not? How? Is violence justifiable, and if so, when? Is conflict necessarily violent?

The teacher, in the course of this lesson, should be urged to provide analogies relevant to the student's interests and experience. We have found, in the course of developing this unit, a decided lack of understanding (through lack of experience) of war on the part of most students. However, if analogies with school situations, parent-child relationships, child-to-child conflicts, or the like, are provided, this unit can be made very real to most teenagers.

Distribute the form entitled "Cycles in War". Allow students to study it as homework or for at least 20 minutes in class.

Again, students should have definite meanings for each item in the vocabulary section.

This chart is very similar to the first. The major difference is, of course, that the data are averaged for 20-year periods from 1481-1940, with estimated violence levels shown for the *10-year* period 1940-50 in the shaded bar. Denton and Phillips indicate "Throughout the period of the data a consistent rise in the level of violence is exhibited for several years (a minimum of 60 years -- a maximum of 120 years). A sharp decline is noted after each rise and the decline is in each rise followed by another rise in violence." (Denton and Phillips, p. 190).

Students will begin to discover (question #1) that the cyclic length can be said to be about 80-120 years. They may also note (#2) that the data are averaged for a different time period (20 years), with a slight overlap of time periods as compared to the first chart.

Question #3 should provide some lively discussion. One might wish to mention Toynbee's ideas of the organic growth cycle:

> The germ of Western society first developed in the body of Greek society, like a child in the womb. The Roman Empire was the period of pregnancy during which the new life was sheltered and nurtured by the old. The "Dark Age" was the crisis of birth, in which the child broke away from its parent and emerged as a separate, though naked and helpless, individual. The Middle Ages were the period of childhood, in which the new creature, though immature, found itself able to live and grow independently. The fourteenth and fifteenth centuries, with their marked characteristic of transition, may stand for puberty, and the centuries since the year 1500 for our prime. (Frederick J. Teggart, *Theory and Processes of History*, Berkeley, University of California Press, 1962, p. 49.)

His theory of the cyclic rise and fall of civilizations might also be mentioned, as well as the ancient Greek ideas of "history as an endless succession of identical cycles of events." (Ibid., p. 48.) In March, 1969, an astronomer posited a course of eternal expansion and contraction of the universe, with an 80-billion year life cycle of pulsation.

By the way, Denton and Phillips discovered a high positive correlation between intense conflcit and a high frequency of civil wars, and theorize that periods "of intense conflict are associated with social change or turmoil . . ." (Denton and Phillips, p. 192.)

Some of the ideas of Denton and Phillips are worth quoting *in extense*:

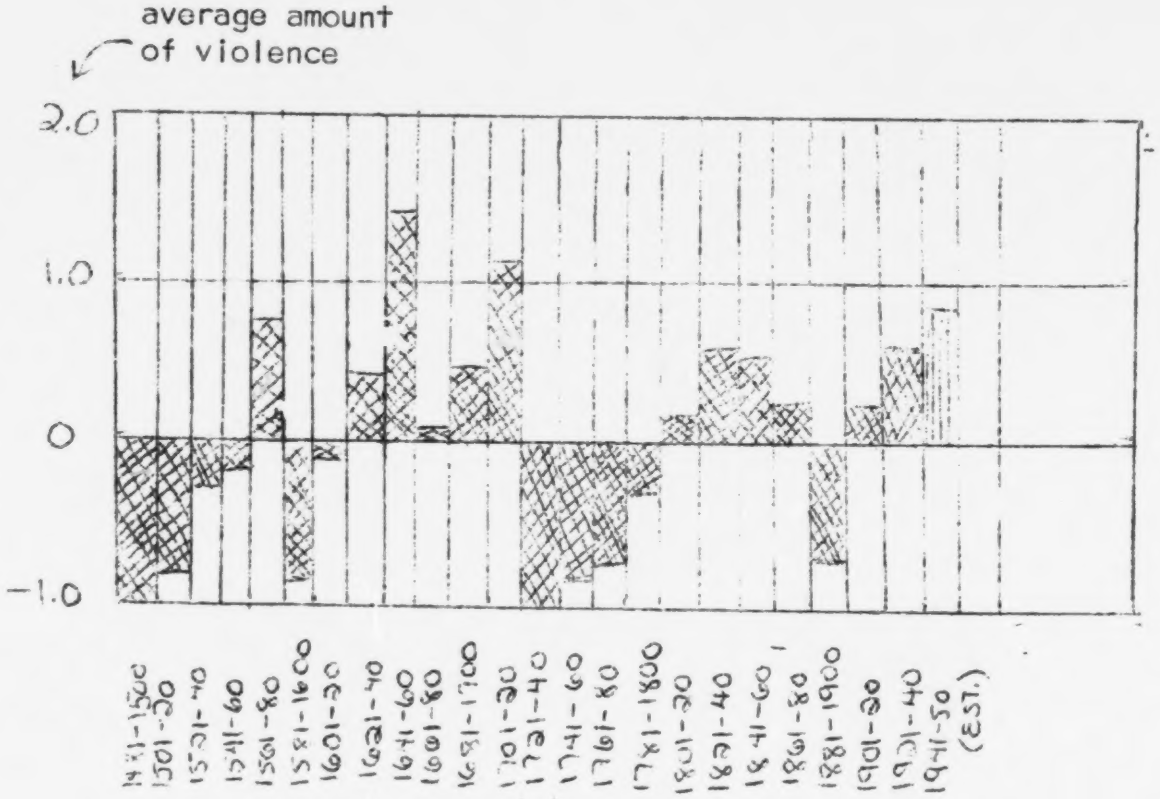
> Several conditions may be associated with such a periodic increase in violence: (1) Immediately following an intense war the public remembrance of it is of the horrors, the human suffering, the dislocations. The "horror" remembrance may be reinforced by the memoirs, biographies, novels, or fireside stories written and told by first-hand participants while their own experiences are fresh. At the same time, the glory of defending the fatherland, the adventure, and the grim humor of war are

ON CONFLICT

CYCLES IN WAR

Well, you have discovered that there seems to be a pattern of "cycles" in the recent history of war. These data, by the way, are from Frank H. Denton and Warren Phillips, "Some Patterns in the History of Violence," The Journal of Conflict Resolution, vol. XII #2 (June, 1968), 182-195.

You may be interested to learn that there are indications of other types of warlike cycles. The same scientists*, using 20-year periods of time and starting with 1481, find that -- well, take a look:



*Denton is with the RAND Corporation; Phillips with the Mental Health Research Institute of the Univ. of Michigan

VOCABULARY: conflict violence cycles recurrent cyclic

QUESTIONS

1. What is the cyclic length of warlike periods according to this chart?
2. How do you account for the differences between this chart and the first one you were given?
3. Do cycles such as these indicate that history repeats itself?
4. What predictive value do materials such as these have?
5. Since warlike activity seems to occur in cycles, can it ever be controlled? Or is man a captive of fate?
6. Looking back at the first chart, when -- if we can use such data to predict the course of the future in a rough way -- when should the next major war occur?
7. Can we consider Vietnam to be that war? What else would we have to know to be able to answer this question?
8. Do you think that mathematical or statistical analysis could be of any help in trying to understand human events? Or should historians just try to "play it by ear"?

> themes which are often expressed. Perhaps, through a defense against the distasteful, the "horror" is suppressed as memories age and as an increasing number of society's members have not had first-hand exposure to violence. On the other hand, the requirement for ensuring willingness to defend the state or society against intruders motivates many to further glorify "dying for one's country." Thus the themes employed in the descriptions of the last great war shift from "horror"- dominant to "glory"- dominant. This shift is then tied to the human life cycle of 20-30 years. . . (2) Perhaps even more important would be the application of a similar thesis to decision-makers. Subjectively, it seems that major conflicts have created the next generation of decision-makers. Thus, for a number of years after major conflicts, the system's decision-makers have had first-hand experience with violence. Decision-makers seldom obtain power before they are 40 to 45 and seldom retain power beyond 65-70. A new, "unsullied" group of decision-makers gradually comes into power after the conflict. A generation's time sees almost a complete turnover. . . . (3) Implicit in the above explanations is an assumption that the opportunities for employing violence are always present. The only condition necessary for violence is the willingness to become engaged. (Denton and Phillips, p. 193.)

The teacher may wish to explore some of these conclusions with the students. The authors also note that modern TV programs of World War II seem somewhat "humor"-dominant. (Ibid.) Interested members of the class may want to check this out.

Explanations of the longer cycle are somewhat more difficult. The authors seek an explanation in the "action-reaction process in political philosophy." "It seems logical to expect that philosophies of change are associated with periods of intense civil violence." Noted are the 16th-17th century religious conflicts, 18th and 19th century Eyropean revolutions, and communist revolutions of the 20th century. "A reasonable hypothesis could be made that, in a given society, the relative weight given to the desire for improving society as opposed to maintaining society is dependent on the conditions of (1) rate of change and (2) discrepancy between the actual and the ideal society." "Thus, first, condition of rapid change, associated with high tensions and violence, induce philosophic positions emphasizing the importance of an orderly society and philosophies glorifying the traditional strengths of the established system. That is, insecurity leads to emphasizing the desire for maintenance of the good aspects of an idealized society of the past. Second, periods of stability reduce the experience and thus the fear of insecurity. . . . The result of these hypotheses is that change tends to be followed by stability, by change again, and so on. The period of the cycle (averaging about a century in length), while it is not intuitively obvious, does not seem unreasonable."

Many of the questions asked concerning the first chart are also a propos.

Similarity of behavior are also evident along other lines. At the conclusion of this lesson, hand out the "Voevodsky Tables" and five blank semi-logarithmic graphs to each student.

SUGGESTED PROCEDURES FOR SUBUNIT: BEHAVIOR OF ESCALATION

Distribute the packet entitled "The Voevodsky Tables" and six blank semi-logarithmic graphs to each student. Each student should carefully consider the brief material on the first sheet. It is not necessary to go into a detailed explanation of the differences between ordinary graphs and the semi-log type; suffice it to say that logarithms (powers of a fixed number, usually 10) are the basis of the slide rule. The most important thing is that the students are able to read, and plot, the locations of numbers on this type of graph. This is the reason for including the first set of questions.

Have the students answer questions 1-3 on scratch paper. It would be very useful to have a blank semi-log graph on the chalkboard or on an overhead projector transparency, to illustrate the answers to questions students may have. The answer to question 1 is 30, approximately; 2, the line exceeds the value of 100 in late October, 1971; 3, the greatest growth rate (shown by the steepest rise of the line) in between January and July, 1970.

It is important that the students try to be as careful as possible when plotting points on the graph. As you can see by the accompanying figures (1-6), the vertical axis plot should begin with a base of 100 (with 10,000,000 maximum) for the Civil War, World War I and World War II graphs, and with 10 (with 1,000,000 at the top) for the Korean and Vietnamese war graphs. Once the points are plotted (and, of course, you may instruct the students to do all, or only one or two lines on each graph, as you feel time permits), they should draw smooth curves generally along the path of dots. Note on the figures (1-6) that the lines are, at best, generalizations. The exactitude of this discovery lesson is not important -- the general slope of the lines is, Have them "smooth out" any sharp corners on their graphs.

Once they begin plotting they will begin to notice the similarity of patterns on the graphs -- and this is the main point. Each of these lines rises sharply at the beginning of each war, indicating escalation. As a theoretical limit of involvement is reached (Voevodsky indicates this is linked to manpower availability), the lines begin to level off, indicating a "saturation" phenomenon. You will note that it is not until this "plateau" is reached that wars come to an end. Note, also, that we find two "scallops" defining the war in Vietnam, indicating that we have in this situation two very different wars (one, from 1960 through the spring of 1965, fought in South Vietnam only, against poorly-armed insurgents; the other, fought in both Vietnams, against both irregulars and regular troops much better armed).

Table 7 also notes the rough parallel between deaths in Vietnam and deaths by rioting in US cities, through 1967. Some questions that might be asked here could include: Why should this parallel be so? What psychological drives have here been unleashed by the war? Can we see any other parallels in past wars? Did this trend continue, as projected, through 1968? 1969? Why or why not, do you suppose?

Dr. Voevodsky's research indicates quite a number of generalizations regarding measurable, and predictable, behavioral data of nations at war. One of these points (hinted at above) is that not until a nation reaches the plateau, or levelling period, can a cessation of hostilities be expected. (This is the reason for question 4.) Speculation on why this is so could be very fruitful. Another point is that friendly and enemy casualties, deaths, strengths in the war theater, and so on, occur in similar patterns -- that there is a "coupling relationship" between opposing forces. This relationship might be close (note British and German casualties) or it might be farther apart -- but it does exist. (See also figure 1.) Not shown here are many other relationships between the curves, such as the death-to-casualty ratio (easily plotted by interested math students on log-log paper, with deaths for one axis and casualties for the other), which shows relative weapons effectiveness; or the intricate mathematical equations showing the measurable relative time sequence of escalation and saturation. Voevodsky has found that there are definite relationships here, which can be given the term "General Form of War" (see figure 8). Students should be encouraged to speculate on such repetitive, measurable behavioral data. What does it indicate about the differences between generations?

Professor Robert North of Stanford University, in his Foreword to Dr. Voevodsky's paper*, makes this statement:

> Early sixteenth century Italy produced a controversial exchange between Niccolo Machiavelli (1469-1527) and his colleague and good friend Francesco Guicciardini (1483-1540) over issues concerned with the unique event in human affairs, the reoccurring pattern, possibilities of prediction, and the like. The debate had complexities and *nuances*, and in many respects the scholars -- and even their basic assumptions -- had more i- common than perhaps either of them realized. In general, however, Guicciardini was impressed by the "instability of all human affairs," which reminded him of "a sea whipped by winds." Fortune, he thought, ruled supreme. "For every hour we find the most momentous results springing from such fortuitous causes as it was not within the power of man either to foresee or to escape." Machiavelli, on the other hand, was looking for whatever seemed permanent in a world of perpetual change. "Whoever considers the past and the present will readily observe," he wrote in *The Discourses*, "that all cities and all peoples are and always have been animated by the same desires and the same passions; so that it is easy, by diligent study of the past, to foresee what is likely to happen in the future in any republic, and to apply those remedies that were used by the ancients, or, not finding any that were employed by them, to devise new ones from the similarity of events.

A possible discussion topic might be the relevance of the study of the past on present and future actions and options. We'll return to this theme in the subunit "Planning for the Future".

Human beings have found that they can bring the socially and economically unacceptable effects of depressions under control by being able, first of all, to determine the measureable course of depression cycles. It may be that, in the future, we may be able to do the same for the unacceptable aspects of war,

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*John Voevodsy, Ph.D., "Quantitative Behavior of Warring Nations", Unpublished MS., Stanford University, 27 March 1968. North quotes from Felix Gilbert, *Machiavelli and Guicciardini, Politics and History in Sixteenth Century Florence* (Princeton: Princeton University Press, 1965), p. 288; and Niccolo Machiavelli, *The Prince and the Discourses* (New York: The Modern Library, 1950), p. 216.

if we find that we are able to foresee a similar wave-form cycle of war and peace. Having found that there are definitely predictable patterns of escalation and involvement-saturation in war may lead to such control of international violence.

Voevodsky presented this study to the National Security Council in the spring of 1968. It is thought that this is one factor in President Johnson's decision to seek active negotiations with North Vietnam, for Voevodsky pointed out that we now had two choices: escalation of troops to some 2-2.7 million, or escalation of weapons effectiveness by using nuclear devices. If, he noted, escalation continues in the established pattern, we would have to have at least 1,000,000 men in Vietnam by the end of 1968, with a total of 80,000 DoD battle deaths by the end of 1968, and 700,000 total DoD battle casualties; US Army battle deaths would be 45,000 and casualties 340,000. "These numbers," he notes, "are definitely the lowest possible if the past behavior pattern holds." (pp. 26-27). To discover these predictions, have a student plot DoD strength versus DoD battle casualties on one graph and extend the resultant line; and DoD battle deaths versus battle casualties on another with the resultant line extended. The 80,000 figure can also be seen in figure 7 on the extended line.

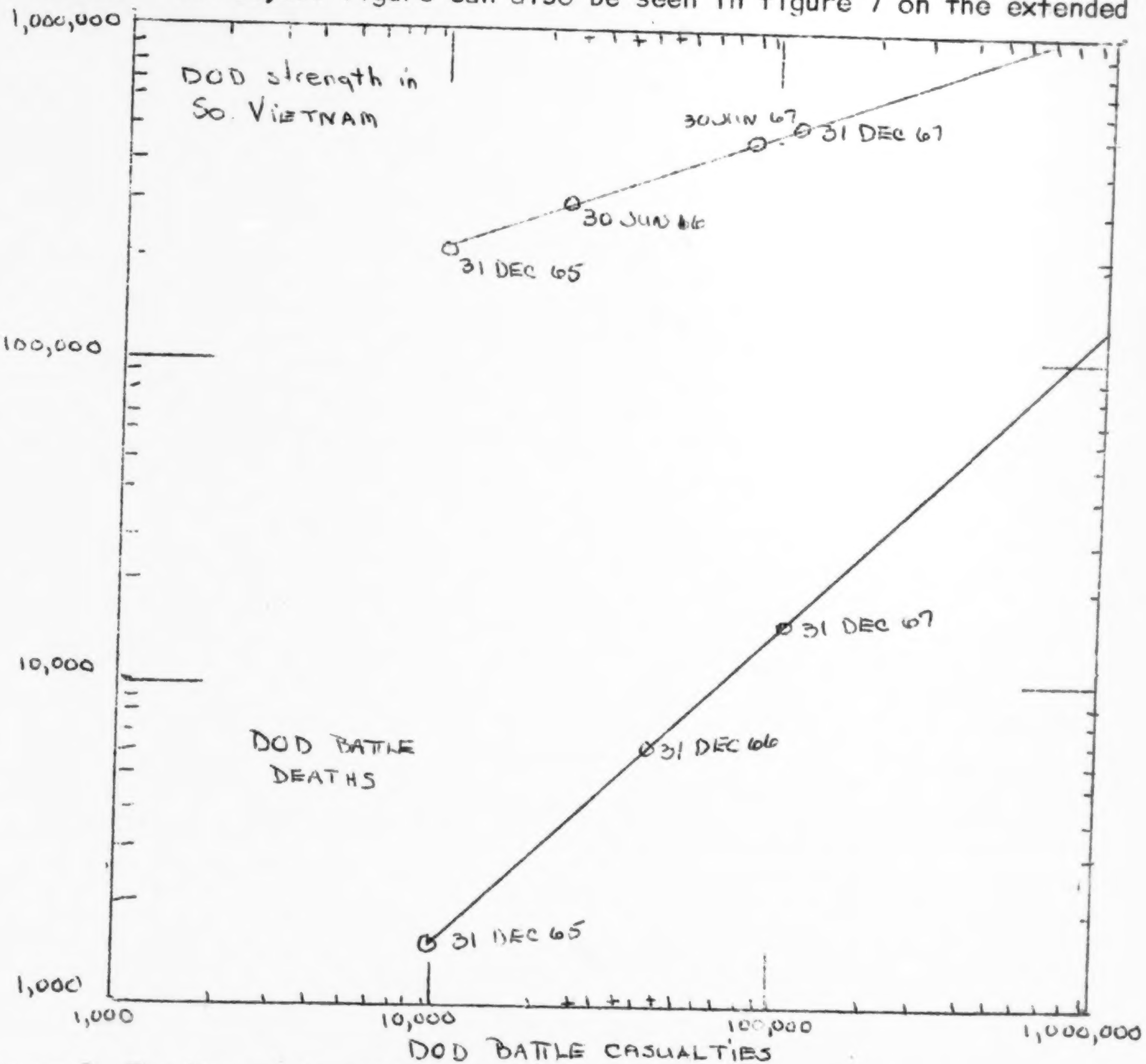


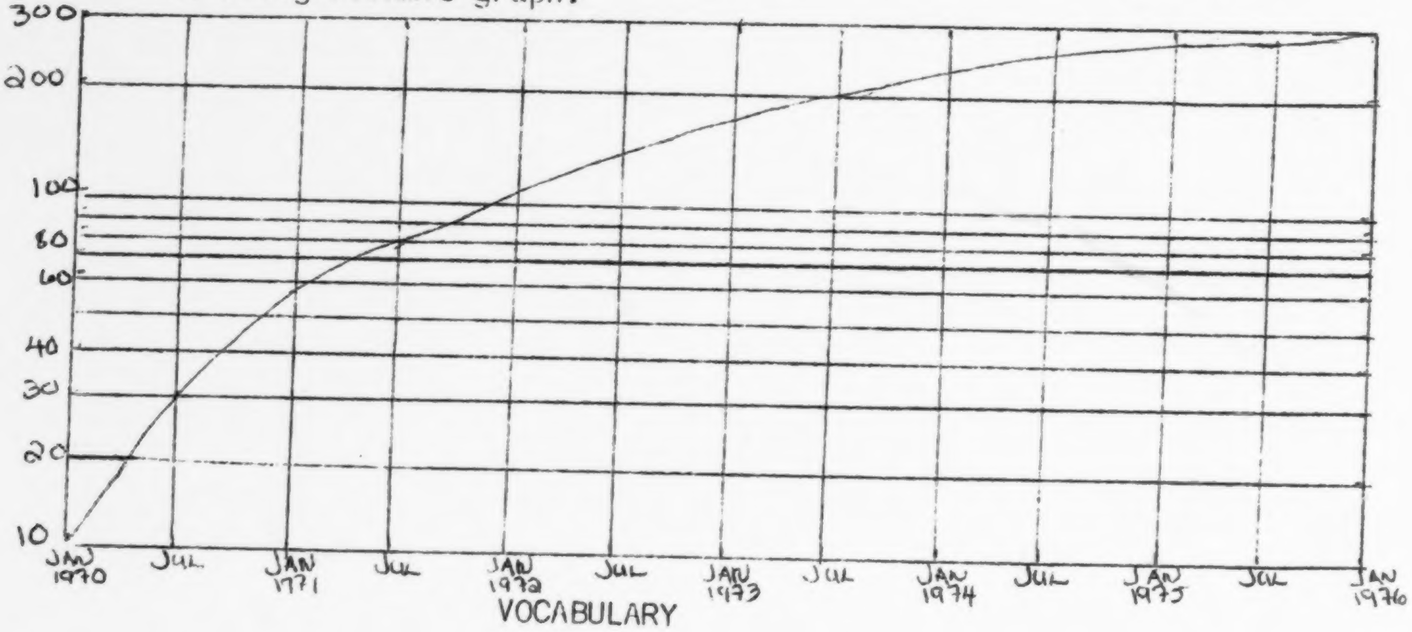
Figure 9, The Voevodsky Tables: VIETNAM WAR FUTURE TRENDS if the past behavior pattern does not change
Figure for overhead projector transparency

ON CONFLICT

THE VOEVODSKY TABLES

In this exercise, you will be given six tables of figures and six semi-logarithmic, or ratio scale, blank graphs. Your object is to plot various sets of data, discover a curve of some sort, analyze the curve, and determine its meaning -- and it has a very important meaning.

First, a brief note about the form of the graphs. They are called semi logarithmic, or ratio, scales, and they show relative change, Mathematicians among the class will be able to point out what logarithms are, and how they are used. How many in the class have used a slide rule? Let's take a look at a section from a semi-logarithmic graph:



VOCABULARY

logarithm ratio graph scale relative curve slide rule rate

QUESTIONS

1. What is the numerical value of the curve in July, 1970?
2. Between which two months of what year does the value of the line go beyond 100?
3. In what six-month period do we see the greatest growth rate?

EXERCISES

Graph number 1: the Civil War. On your first blank graph, plot curves using the following data: Union strength, Confederate strength, Union deaths, and Confederate deaths. You should have four curves. Using the plot marks, draw smooth curves showing an "idealized" line (do not feel that it is necessary to join all the dots of any one curve-make the line smooth, and have it conform to the general shape of the "line" which the dots form). You must, of course, decide on a scale for the graphs. Hint: start with 100 as the value of the lowest line on the vertical scale. Be careful that you use a proper arrangement of years and months along the horizontal scale (otherwise the shape of your curve will be distorted).

Graph 2: England, France, Germany. On the next blank graph, plot British casualties, German casualties, French losses, and German losses. Remember how you plotted graph I, and do the same with this graph. Be sure that you label each line on your graphs, and that you label each of your graphs.

Graph 3: World War I, U.S. Plot Army strength and Army deaths.

Graph 4: World War II, U.S. Plot each of the columns of figures.

Graph 5: Korean War. Plot each of the columns of figures.

Graph 6: Vietnam War. Plot each of the columns labelled Army casualties, DoD casualties, Army deaths, and DoD deaths. Some may also wish to plot the strength columns. Hint: use 10 as the value of the lowest line on the vertical scale.

QUESTIONS

1. What do you discover that is startling about Graph I? Do you see a pattern of any kind?
2. Do you see this happening on any of the other graphs? Which?
3. What do you think that it indicates?
4. On each of the graphs, put an "x" on the curve at the point where the war comes to an end. (Civil War, April 1865; World War I, November 1918; World War II, September 1945; Korean War, July 1953;.) Extend the curve until it reaches the "x".
5. Think carefully about this one: At what point during a war, according to what we see here, can a war come to an end? Do we ever see a war coming to an end sooner than this?
6. What importance does this question -- #5 -- have for us?
7. What do you see that is peculiar about the curve for the War in Vietnam?
8. How do you account for this?
9. Find data for the number of troops in Vietnam for June, 1968, and December, 1968. Plot the strength curves. Do these last figures conform to the curve? Why, do you suppose?

THE VOEVODSKY TABLES

TABLE 1: THE U.S. CIVIL WAR

date	UNION STRENGTH	CONFED. STRENGTH	UNION CASUALTIES	CONFED. CASUALTIES	UNION DEATHS	CONFED. DEATHS
Jul 1861	186,751	112,040	1,492	1,969	481	387
Jan 1 62	575,917	351,418				
Mar 62	637,126	401,395	6,227	5,726	1,407	1,101
Jun 62			32,435	42,499	6,141	7,558
Jan 1 63	918,121	446,622				
Mar 63			87,947	87,801	15,496	15,500
Jun 63			107,811	103,756	18,479	18,091
Jan 1 64	860,737	481,160				
Mar 64			146,136	147,684	24,656	24,906
Jun 64			208,879	182,741	35,526	30,925
Jan 1 65	959,460	445,203				
Mar 65			249,489	231,518	41,783	40,086

NOTES: These data are from John Voevodsky, "Quantitative Behavior of Warring Nations," mimeographed MS.

Union and Confederate strength are the number of persons actually on the rolls on the dates given.

Union and Confederate casualties and deaths are the accumulated figures of total battle casualties and accumulated total battle deaths mutually caused.

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TABLE 2: WORLD WAR I: ENGLAND, FRANCE, AND GERMANY

date	BRITISH STRENGTH	BRITISH CASUALTIES	GERMAN CASUALTIES	BRITISH DEATHS	GERMAN DEATHS	FRENCH LOSSES	GERMAN LOSSES
Dec 1914						1,108,000	747,465
Mar 1915	450,000	29,653	14,096	6,648	2,927		
Jul 1915	980,000	148,143	57,807	28,162	12,299		
Dec 1915	980,000	250,000	94,957	47,940	20,682	2,478,000	1,283,744
Jun 1916		365,104	180,531	68,424	32,704		
Dec 1916	1,600,000	810,209	368,005	157,342	70,132	3,354,000	1,956,531
Jun 1917		1,101,112	504,064	217,480	99,766		
Dec 1917	1,800,000	1,517,844	716,752	293,483	142,800	3,923,000	2,392,405
Jul 1918		1,850,112	1,137,557	338,486	223,080		
Oct 1918	2,000,000	2,117,489	1,313,665	402,022	251,308		
Dec 1918						4,938,000	3,072,456

NOTES: British strength is the total number of British Army personnel in France. British and German casualties and British and German deaths are accumulated figures, caused by each other. French and German losses include deaths, wounded, missing and prisoners of war and are accumulated figures, caused by each other.

TABLE 3: WORLD WAR I: UNITED STATES

DATE	ARMY STRENGTH	ARMY DEATHS
Jul 1917	20,000	
Sep 17	45,000	
Dec 17	129,000	
Mar 1918	253,000	
Jun 18	722,000	1,950
Sep 18	1,576,000	17,880
Oct 18	1,843,000	38,347
Nov 18	1,971,000	45,973

NOTE: Army strength is the total number of U.S. Army personnel in France. Army deaths are the accumulated total Army battle deaths in France.

TABLE 4: WORLD WAR II: UNITED STATES

DATE	ARMY STRENGTH	ARMY CASUALTIES	ARMY DEATHS
Jun 42	601,777	3,032	1,242
Dec 42	1,064,643	10,297	4,258
Jun 43	1,637,419	35,902	11,622
Dec 43	2,618,075	84,249	26,850
Jun 44	3,882,224	217,979	64,898
Dec 44	4,933,682	605,639	153,020
Mar 45	5,403,931	806,182	196,635
Jun 45	5,239,722	902,156	220,037

NOTE: Army strength is the total number of U.S. Army personnel outside the continental United States.

TABLE 5: KOREAN WAR: UNITED STATES

DATE	ARMY STRENGTH	ARMY CASUALTIES	ARMY DEATHS
Jun 50	450	24	18
Jul 50	48,268	6,003	2,857
Aug 50	90,092	11,672	4,467
Sep 50	132,108	24,033	7,328
Dec 50	163,507	37,783	12,418
Mar 51	202,590	50,804	15,784
Jun 51	229,291	64,311	18,327
Sep 51	232,977	73,024	20,179
Dec 51	227,869	84,423	22,357
Mar 52	234,640	86,288	22,704
Jun 52	238,615	89,586	23,357
Sep 52	231,355	94,305	24,416
Dec 52	219,738	99,580	25,512
Mar 53	223,295	102,096	26,094
Jun 53	246,583	106,427	26,958
Jul 53	276,581	109,948	27,700

NOTE: Army strength is the total number of U.S. Army personnel in Korea.

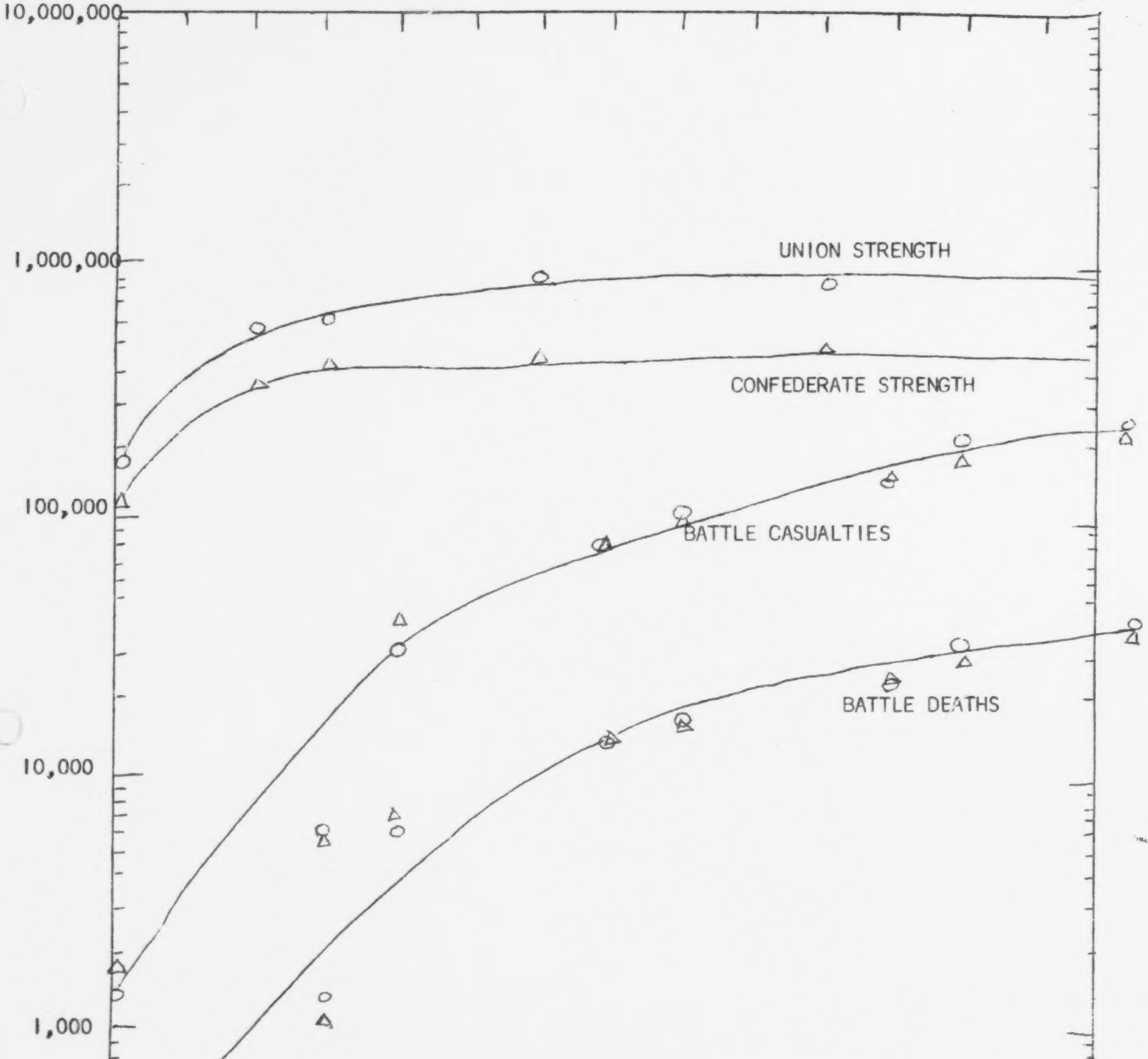
TABLE 6: VIETNAM WAR: UNITED STATES

DATE	ARMY STRENGTH	DOD STRENGTH	ARMY CASUALTIES	DOD CASUALTIES	ARMY DEATHS	DOD DEATHS
Dec 60	800	900				
Dec 61	2,100	3,200	7	14	5	11
Dec 62	7,900	11,300	98	123	22	42
Dec 63	10,100	16,300	524	612	67	120
Dec 64	14,700	23,300	1,533	1,798	185	267
Mar 65	15,600	29,100	1,984	2,312	238	339
Jun 65	27,300	59,900	2,386	3,026	317	48[illegible]
Sep 65	76,200	132,300	2,966	4,726	410	744
Dec 65	116,800	184,300	6,070	9,281	1,083	1,636
Jun 66	160,000	267,500	17,773	26,825		
Dec 66	239,400	385,300	27,717	44,382	4,156	6,644
Jun 67	285,700	448,800	48,517	81,194		
Dec 67	320,000	486,000	66,773	115,785	9,599	16,022

NOTES: ARMY strength is the total number of U.S. Army personnel in South Vietnam.

DOD means Department of Defense.

DOD strength is the total number of U.S. military (Army, Navy, Air Force, Marine Corps, Coast Guard) personnel in South Vietnam.



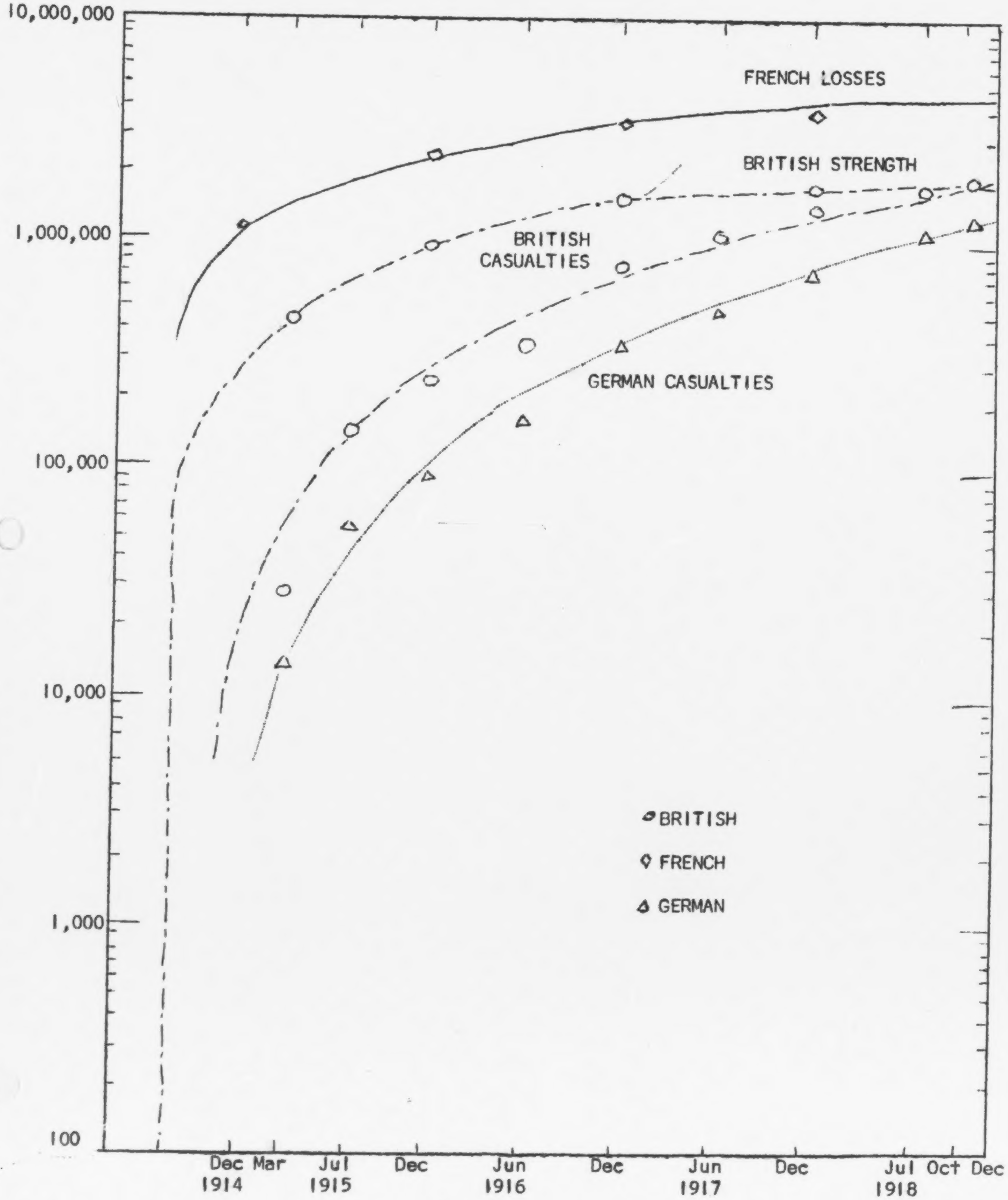
THE AMERICAN CIVIL WAR SHOWING ESCALATION-SATURATION PATTERNS

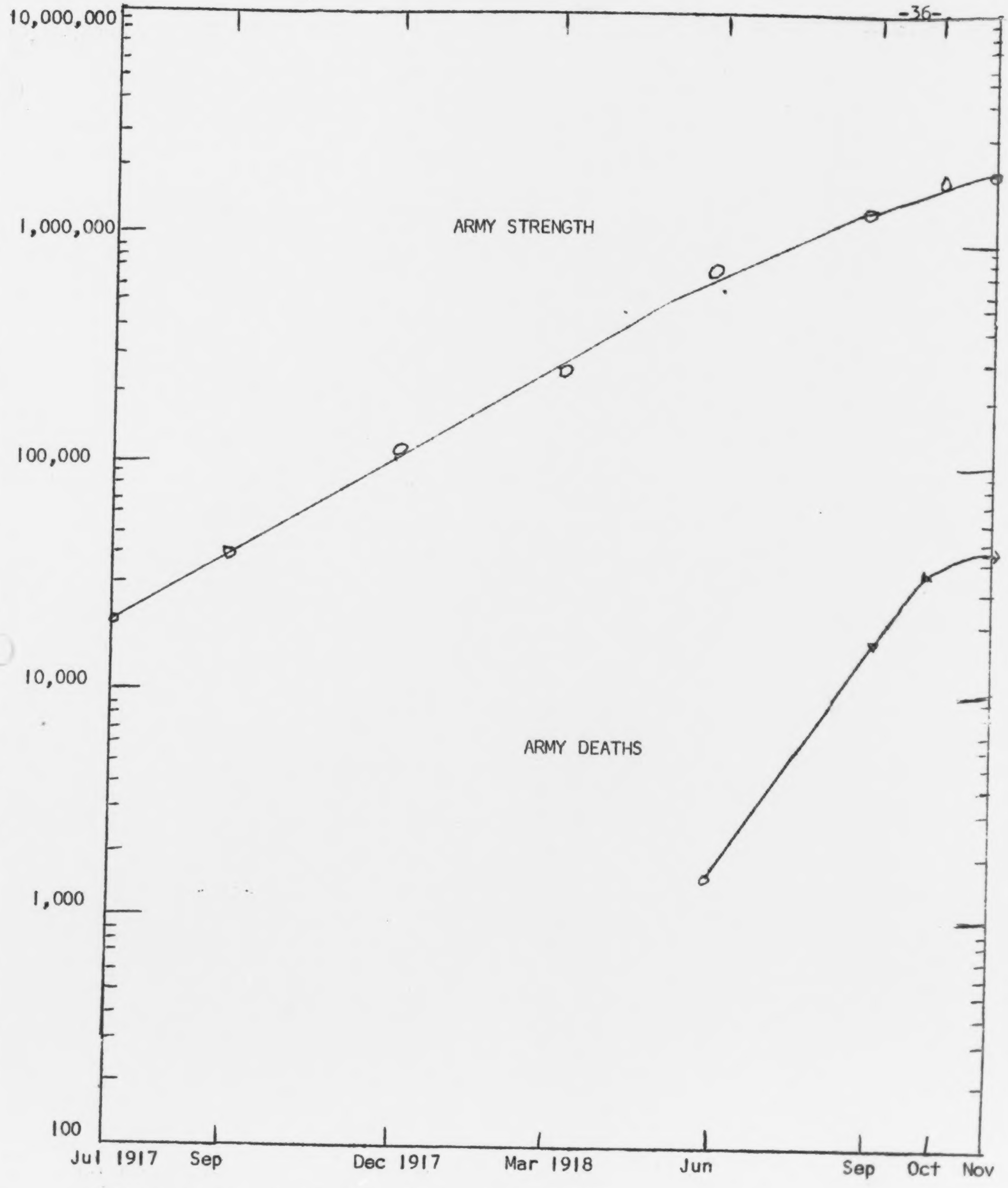
Figure 1, The Voevodsky Tables on Behavior of Escalation
Figure for Overhead Projector Transparency

Figure for Overhead Projector transparency

Figure 2, The Voevodsky Tables on Behavior of Escalation

WORLD WAR ONE: ENGLAD, FRANCE, AND GERMANY





WORLD WAR ONE: UNITED STATES ARMY PARTICIPATION

Figure 3, The Voevodsky Tables on Behavior of Escalation

Figure for Overhead Projector Transparency

Figure for Overhead Projector Transparency

Figure 4, The Voevodsky Tables on Behavior of Escalation

WORLD WAR TWO: UNITED STATES ARMY PARTICIPATION

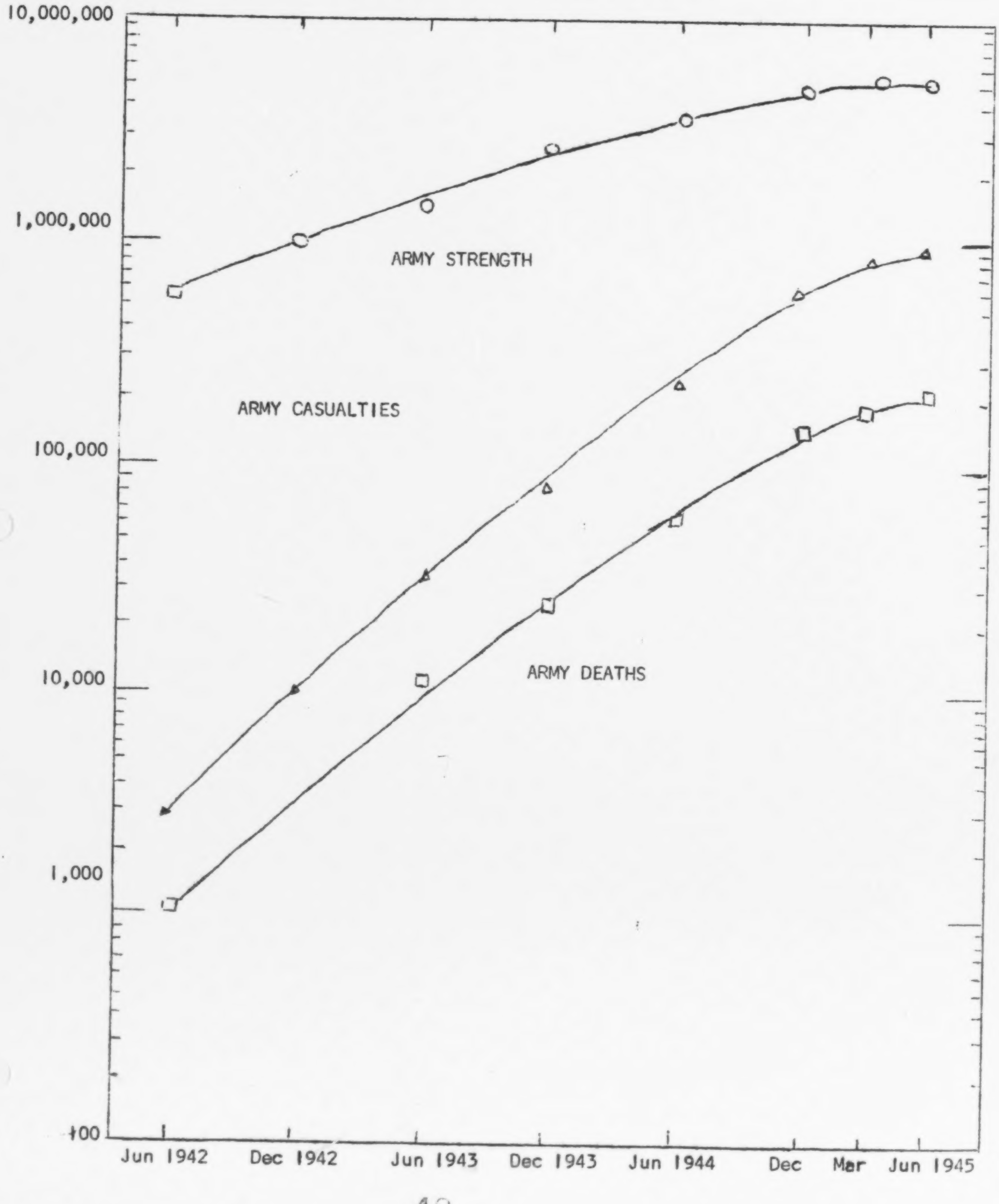
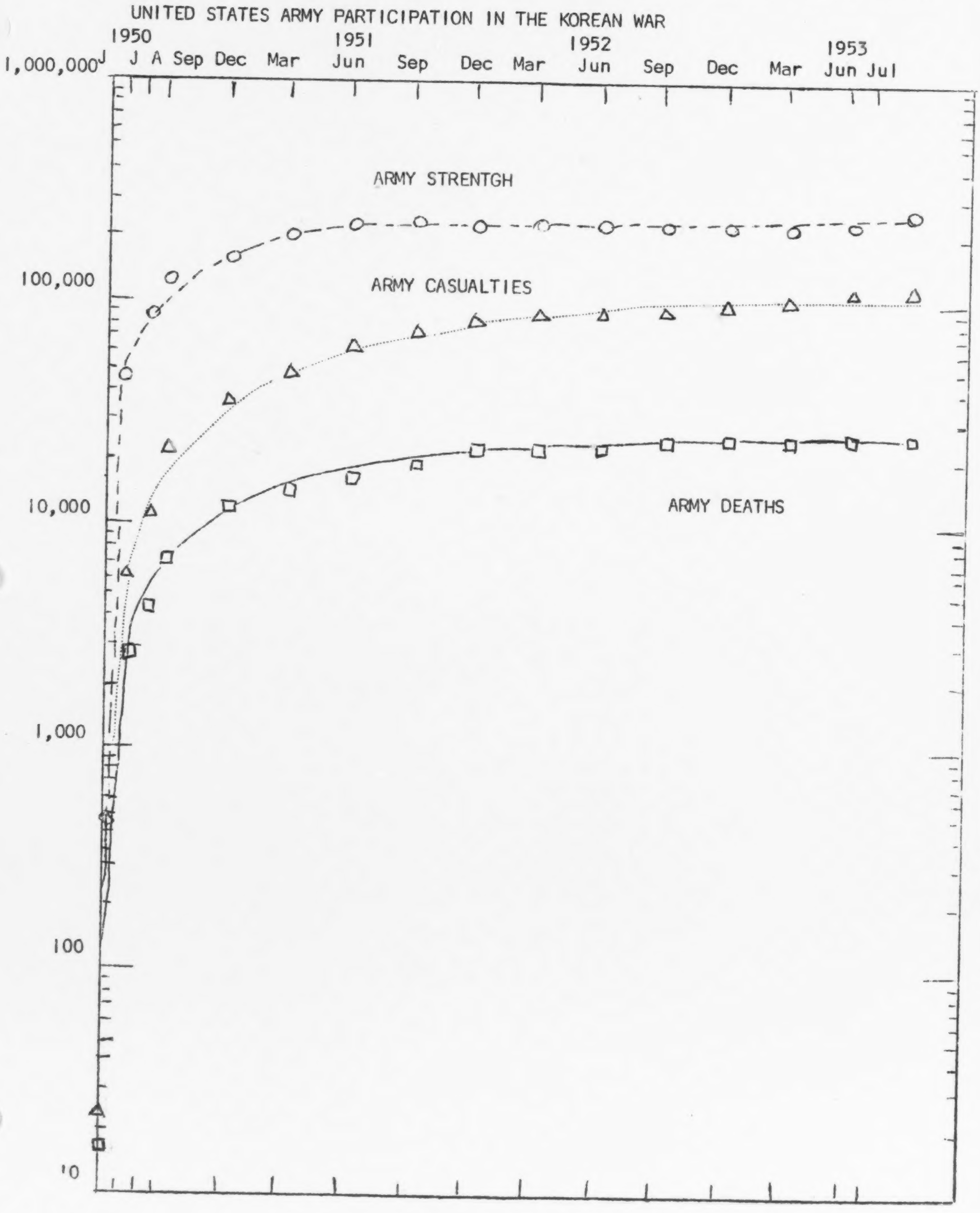


Figure 5, The Voevodsky Tables on Behavior of Escalation: for overhead transparency



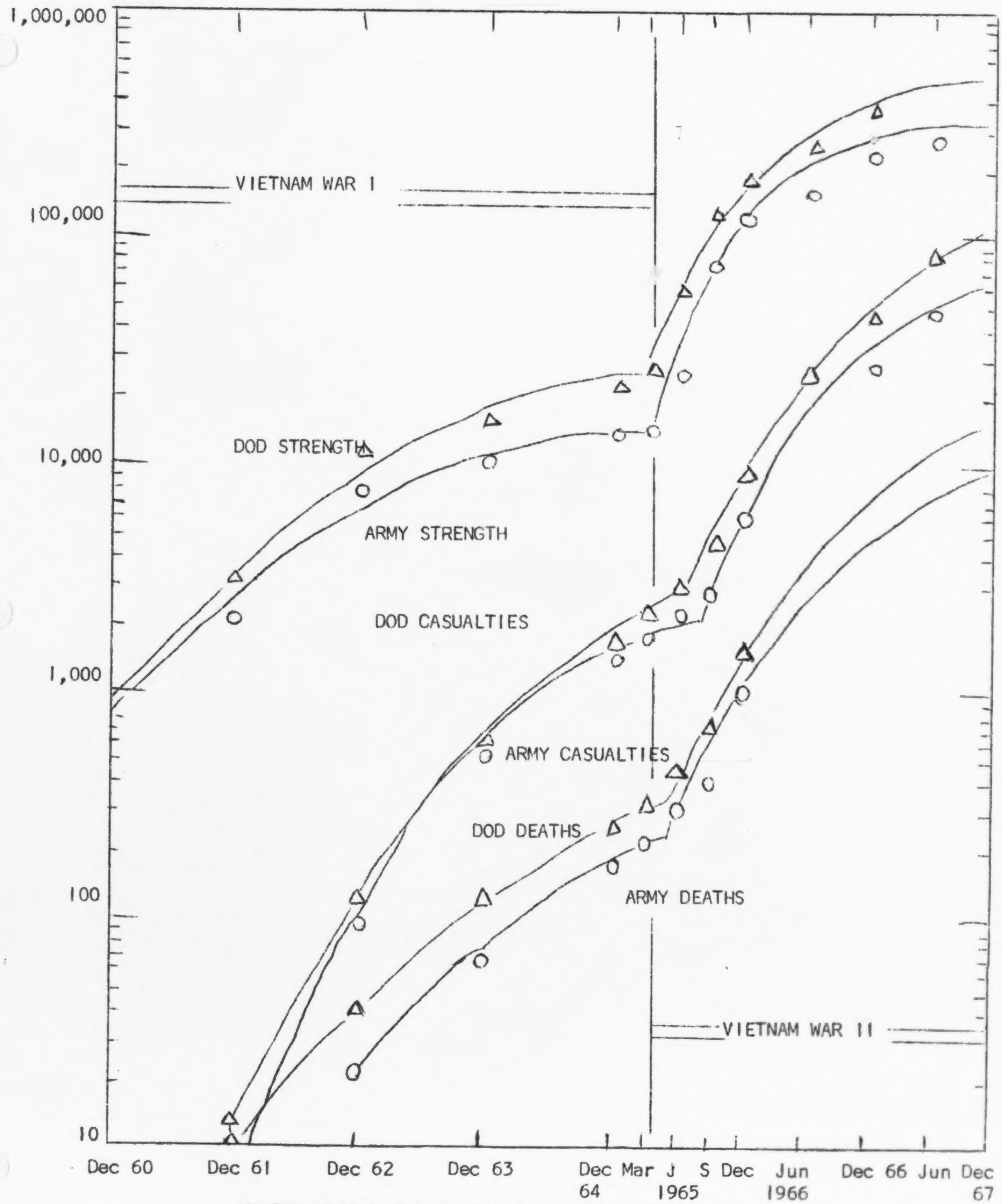


Figure 6, The Voevodsky Tables on Behavior of Escalation

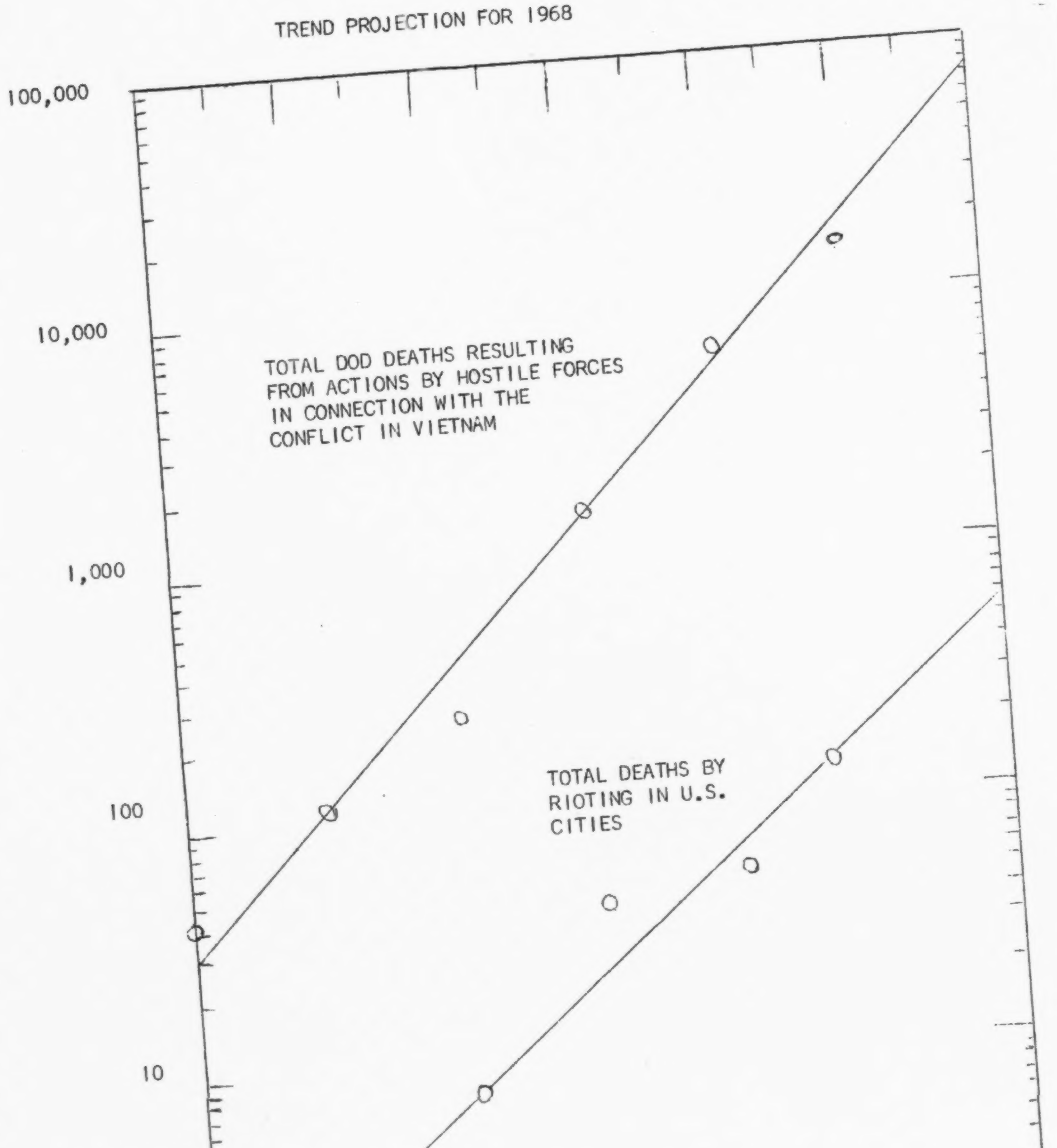


Figure 7, The Voevodsky Tables on Behavior of Escalation: for overhead projector

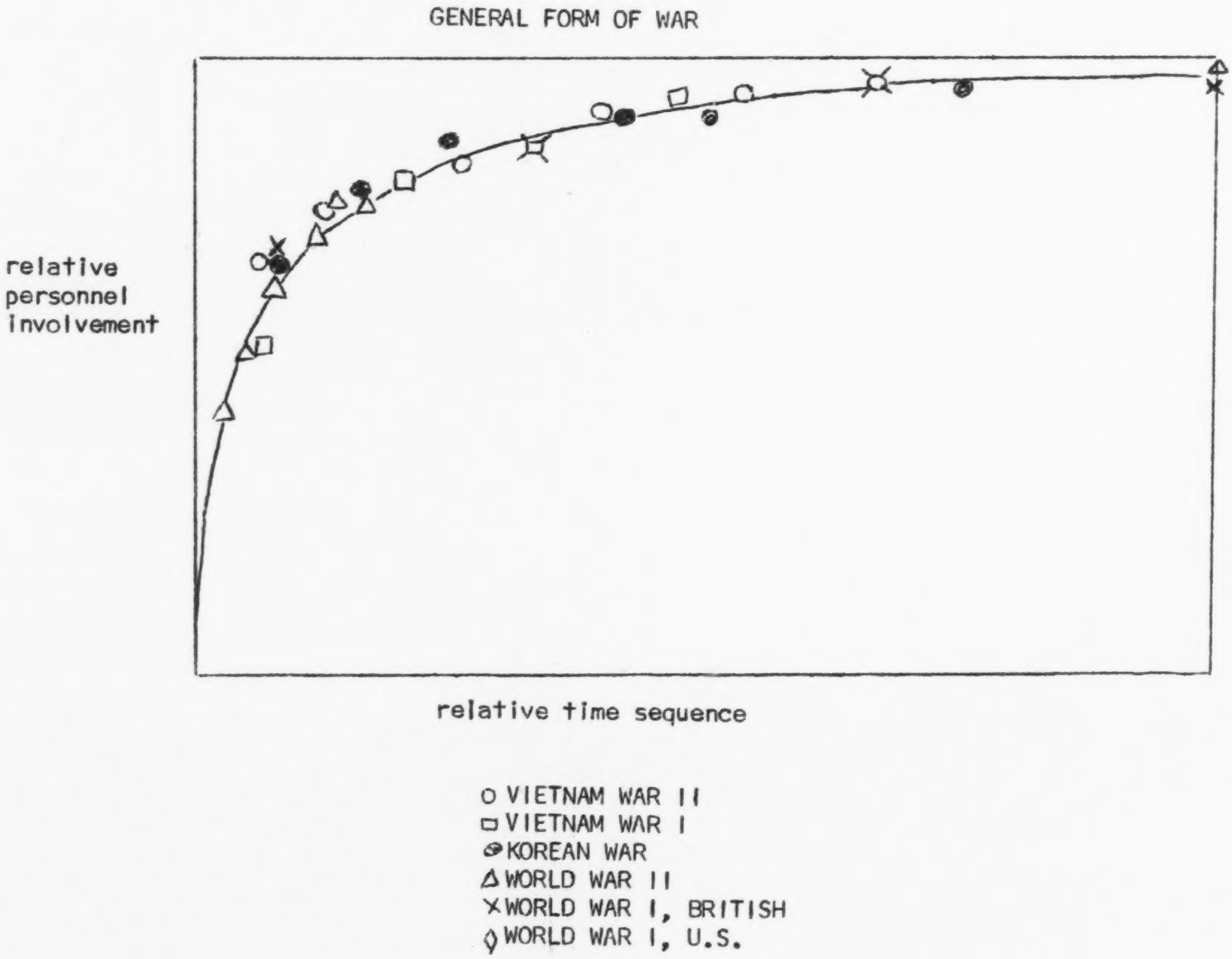


Figure 8, The Voevodsky Tables on Behavior of Escalation

for overhead projector transparency

SUGGESTED PROCEDURES FOR SUBUNIT: ARMS AND INSECURITY

Distribute the readings entitled "Arms and Insecurity." These may be read either as homework or in class.

These readings are intended to be a review of the "Richardson process". Lewis F. Richardson, British scholar and mathematician, studied war as a social and mathematical phenomenon from the late 1930's until his death in 1953. His two monumental works, Arms and Insecurity and Statistics of Deadly Quarrels, are now considered to be classics in the field. They are, however, difficult reading for the non-mathematician. Most of chapter XXII, "Analogies with Disease", is reproduced here for student perusal. Few changes have been made: a few vocabulary substitutions and the excision of some mathematical formulae, and the like, an approach for class discussion might be, "How might a psychologist look at the coming of war? Is this cycle truly an organic one? Is it useful to think of human phenomena in terms of physical properties -- of thinking of the coming of war as a wave-form? (Note that figure 2, for an overhead projector transparency, puts Richardson's idea in just that form). Can you discover any other statements about the coming of war similar to Hankey's, or Hitler's? What could we say today about immunity? Are today's pacifist groups congenitally immune, or is their immunity acquired? How can we so decide?"

A very readable "translation" of Richardson's work may be found in Anatol Rapoport's Fights, Games and Debates (Ann Arbor: University of Michigan Press, 1960), part I, to which the teacher is referred. Mathematically-minded students would also find this book interesting.

Richardson also notes that "an arms race is a self-stimulating 'mechanistic' process" (Rapoport, p. 38). This is referred to in both the excerpt from Wright and that of Boulding. This self-stimulating process we have seen before (Dilemma), and the students will probably remember it. It might be very useful to elicit discussion on this point; perhaps another short session of Dilemma would be worthwhile. Students will be able to provide examples of this process. Essentially, it is that one's own actions today will have an effect on those around one, and their reactions will in turn cause one to act in a certain way. Hence, one's actions now will have an impact on one's actions and options in the future -- electronics engineers know this phenomenon as "feedback". This is illustrated by figure I.

This process is intricately interwoven with the process of perception (and misperception). Discussion might elicit examples of these processes seen previously in the Dilemma subunit. An imaginative teacher will be able to come up with many questions, but let me suggest one or two. If we learned that the Chinese were building a superbomb, what would we do? What would they do in return? Then what would we do? Would it make any difference that they might be building such a bomb just to deter what they might think of as our "aggressive posture", because we are well armed? Would they in fact be perceiving American intentions accurately?

Is building a shelter for one's own defense an aggressive act? Will another nation consider it likely that one is doing so because one has plans for aggression -- that the shelter is "proof" of aggressive intentions? What about an ABM system? If you feel insecure in your home, will buying a gun really give you security -- or might it cause others also to buy guns, which will in fact decrease your security?

In the sixties, in the midst of the cold war and domestic unrest, the concept of the Richardson Process is very apropos, We have had the "great shelter debate," we shall be debating the ABM system for some time, and we have seen the effect of gun-buying and riots.

For those wishing to illustrate the "cycle of war" theory, the analogy of business cycles might be useful. For those wishing to illustrate the Richardson Process, the passage of Clemens' Tom Sawyer, wherein Tom meets the new boy in town, is suggested.

For a logical outcome of the Richardson Process, see figure 3.

ARMS AND INSECURITY

The following is taken from Lewis E. Richardson's Arms and Insecurity, pp. 232-236. London, Stevens, 1960.

War fever is a common phrase. Let us examine its implications. You will not, I hope, suspect me of being so crazy as to suggest that war is due to bacteria or to a filterable virus, when I put down for discussion that fighting resembles measles, influenza, or typhoid fever in five relationships. First, fighting is infectious; the infection is borne by sights and sounds, by rumor, by newspapers, radio and television. Second, some people are naturally immune. Third, there is something in war analogous to the rise of temperature in fever. Fourth, a long and severe bout of fighting confers immunity on most of those who have experienced it, so that they no longer readily join in fights. Fifth, this acquired immunity is not permanent but fades out after a decade or two. Also there arises a new generation, not rendered immune by experience. Sixth, these resemblances raise the question whether there could possibly be anything like a vaccine.

It has been remarked that dogs and monkeys join in fights with which they have no obvious concern. The story of the Irishman who said, "There's a grand fight, and me not in it!" seems to be a true description of the state of mind of some of those who go voluntarily to join forces at the beginning of wars. Donald Hankey thus described the beginning of the war of 1914 in London:

> "Some of us enlisted for glory, and some for fun and a few for fear of starvation...In this matter of the war all classes were at one -- at one not only in sentiment but in practical resolve. The crowd that surged outside the central recruiting offices in Great Scotland Yard was the proof of it. All classes were there, struggling for the privilege of enlisting in the new citizen army, conscious of their unity, and determined to give effect to it in the common life of the service...Men and boys of the working class formed the majority. They were in their element, shouting, singing, with as much ribald good humour as if the recruiting office had been a music hall."

In describing the outbreak of the great war in 1914, which occurred when he was 25 years old, Hitler wrote:

"For me these hours came as a deliverance from the distress that had weighed upon me during the days of my youth. I am not ashamed to acknowledge today that I was carried away by the enthusiasm of the moment and that I sank down upon my knees and thanked Heaven out of the fullness of my heart for the favor of having been permitted to live in such a time."

Prewar immunity can be congenital or acquired. The most noteworthy examples of the immune are the conscientious objectors. It is customary in some high quarters to dismiss them all as mere cowards or shirkers. I cannot assent to this wholesale description, for I have known personally at least a dozen Britishers who held strict principles against fighting, yet who were awarded the Croix de Guerre for succoring wounded under shellfire. The best general description of conscientious objectors is, I think, that they have an intense aversion from inflicting cruelties; as to courage or cowardice or as to introversion or extroversion, they are scattered in wide ranges. The causation of this prewar immunity, to what extent it is congenital and to what extent and how acquired, is a problem of great interest.

The new generation, for whom I write, will not be able to understand the instability of peace, unless they understand war fever. A theory has been published in which war moods are regarded as infectious. Each mood is regarded as dual, having an overt part and a concealed part. These are written, respectively, above and below in the same bracket. The changes of mood, from a friendly peace through war to a resentful peace, are summarized thus:

	Arms race	Outbreak	Attrition	Armistice
friendly	friendly	hostile	hostile	war-weary
friendly	hostile	friendly	war-weary	hostile

In contrasting acquired immunity with war-weariness the following examples may be useful.

1. At a certain great English college there was in 1919-20 a contrast of feeling. The old Fellows, who had been unable to fight, still hated the Germans fiercely, whereas the young Fellows, who had just returned from fighting the Germans, felt that "after all, we have done to the Germans much the same as they have done to us."
2. Holidaying on foot with a knapsack was out of fashion in England for about five years after 1918, I suspect beacuse of its resemblance to infantry exercises.
3. The weariness of the victors in the great war in 1918 was shown in 1922 and 1923 by their reluctance to resist a comparatively small aggression by the Turks. In Britain: "The threat of renewed war with Turkey was profoundly unpopular."
4. There was an interval in London (1925-28?) when plays about the great war were out of favor and books about it did not sell.
5. The British Legion, an organization of ex-service men, was conspicuously active in promoting friendly relations with the Germans, whom they had fought against in the war of 1914-18, by organizing exchanges of visits.

Acquired immunity is seldom permanent. When one cannot find statistics, it may be permissible to quote the experience of a leading man, for the fact that he is a leader implies that his sentiments were probably typical of an important part of the nation. Mr. Clement R. Attlee "saw service at Gallipoli, commanding a covering party at Suvla, and was severely wounded in the relief of Kut. He was wounded again, fighting as a major in France, and was in hospital when the Armistice was signed. Peace found him disillusioned, feeling that the men in the army had been cheated. For a time he was a pacifist and took a prominent part in the 'No War Movement'". By 1924 he was undersecretary of state for war.

E. M. Remarque's All Quiet on the Western Front was first published in March 1929 in English and had run to 195,000 copies before August. These dates seem to mark the stage at which the thought of war, though disagreeable and shocking, had become very interesting to large numbers of people, since this book describes the war in realistic detail. At that time, 1928-29, actual war was not threatening. The statesmen were arranging the Kellogg-Briand Pact for the Renunciation of War. If people thought imaginary war to be disagreeable and shocking, why did they attend to it? The Freudian explanation might be like that of the prude who is shocked by his social judgment but attracted by his instinct. Alternatively, one might say that the young generation, growing up, wished to know what their elders had suffered.

The general conclusion is that we must not mistake war-weariness for a permanent conviction that war is morally wrong.

* * * * * * * *

The following selection is taken from Quincy Wright, A Study of War, Chicago, University of Chicago Press, 1942, 1965, pp. 1482-3.

Richardson interprets cooperation as the opposite of war...stability can only be achieved...by more cooperation, though augmentation of defensive armaments and diminution of offensive armaments might help. One must distinguish between three types of armament as Jonathan Griffin (1936) has emphasized:

> 'bombing airplanes that threaten foreigners sleeping peacefully in their homes, anti-aircraft guns that threaten only invaders, and air raid shelters that in fact threaten no one although they may alarm those whom they are designed to protect. In a roundabout way bombing airplanes are a danger to the nation that owns them.'

Richardson believes that he has demonstrated by mathematical analysis 'defensive coefficients are positive, that is, the greater the rate of armament building, the greater the need of defense. Preparedness increases security; otherwise there would not be armament races.'

* * * * * * * *

Kenneth E. Boulding, Conflict and Defense: A General Theory, New York, Harper Torchbooks, 1962, pp. 24-25, 32-33.

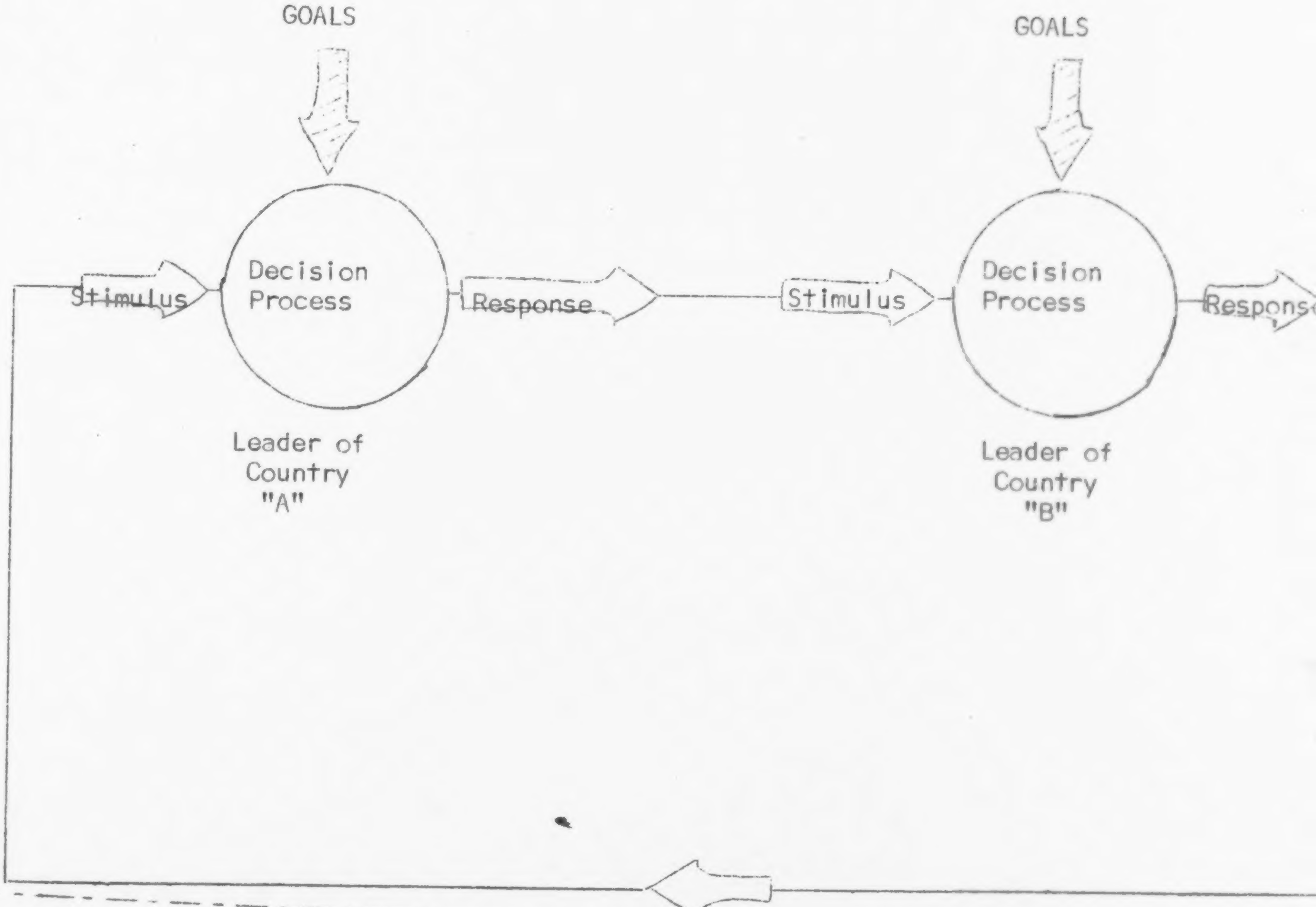
...we must now get down to the consideration of the nature of conflict processes. Perhaps the most important class of these processes is what may be called reaction processes. These are processes in which a movement on the part of one party so changes the field of the other party that it forces a movement of this party, which in turn changes the field of the first, forcing another move of the second, and so on. The economist is familiar with the reaction process in the theory of oligopoly, especially in the theory of the price war. The political scientist meets the reaction process in the concept of the arms race, which is theoretically very similar to the price war. We find the same processes going on, however, at all levels of relationship -- between union and management, between husband and wife, between king and parliament, between president and congress, between administration and faculty, between teacher and student, and even in the animal kingdom, between predator and prey, parasite and host, eater and eaten. By far the most extensive theoretical treatment of these processes has been made by Richardson, whose remarkable pioneering work is only now receiving recognition. It would only be just to name these processes Richardson processes in his honor.

A very interesting case which was studied in some detail by Richardson is that of the submission of one party to another. We may suppose that a party will exhibit a positive reaction coefficient for low levels of hostility but that as the hostility of the other party increases beyond a certain point, the first party will become cowed and its hostility will diminish. That is, its reaction coefficient will become negative. The nature of the resulting equilibrium is very peculiar. Suppose we start with two parties where A is very hostile and B is cowed into friendliness. Because of B's friendliness, A's hostility diminishes. A can afford to let his defenses down. As he does so, however, B becomes less cowed and his hostility increases. Then both hostilities increase -- B's because A's level is low enough that B is not completely cowed, and A's because of the fear of the rising level of B. At this point, A's hostility increases rapidly in response to B's high level of hostility, but B's declines because he is cowed by A's high hostility. Then both hostilities decline, A's because B is now adequately cowed, and B's because A's hostility is now so high. Then the cycle repeats itself, but on a diminished scale.

We may note that there is a possible equivalent in this system as seen another way, where the equivalent of submission is revulsion, a lessening of the friendliness of one as a result of too much friendliness by the other. The notable cyclical movement of young people in love may be an expression of this system.

figures for overhead transparence

Figure I, The Richardson Process
THE SELF-STIMULATING PROCESS


GOALS
GOALS
Stimulus
Decision Process
Response
Stimulus
Decision Process
Respons
Leader of Country "A"
Leader of Country "B"

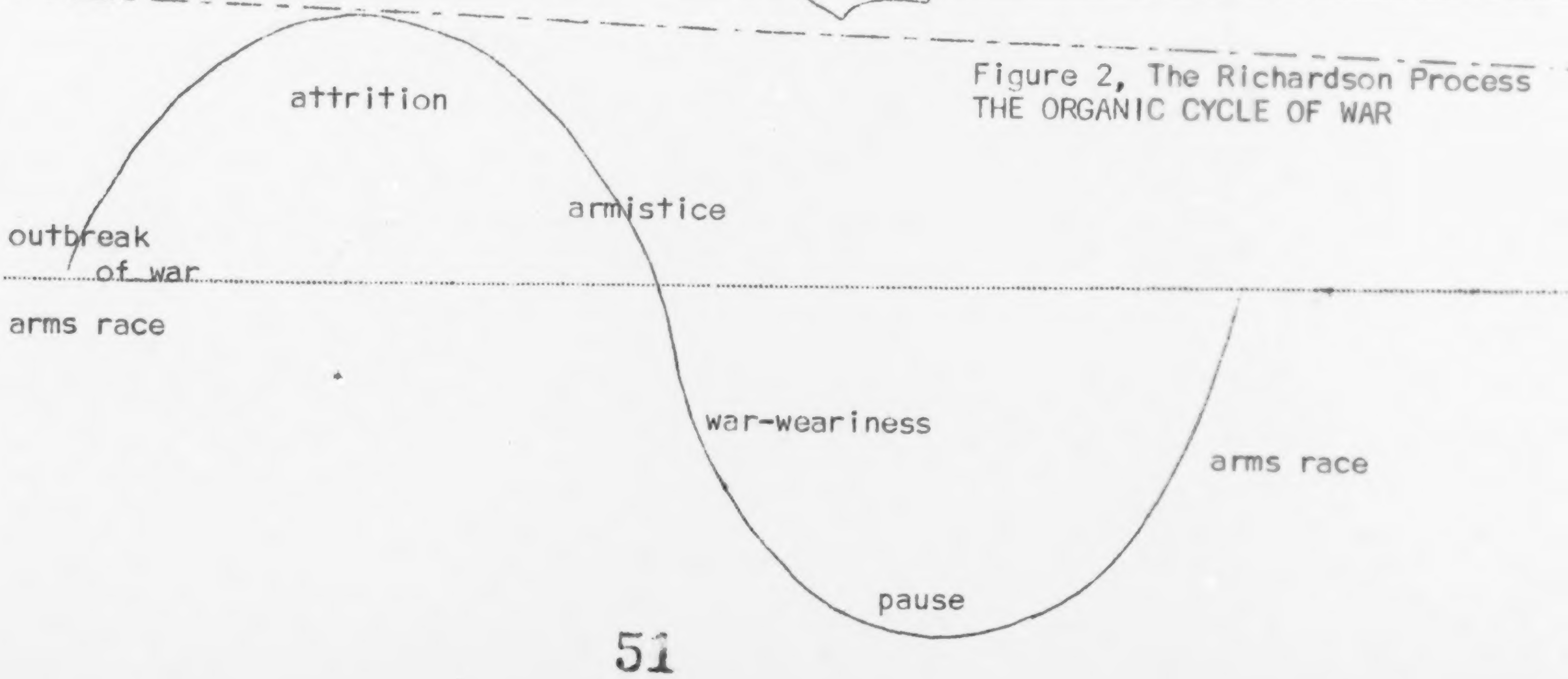
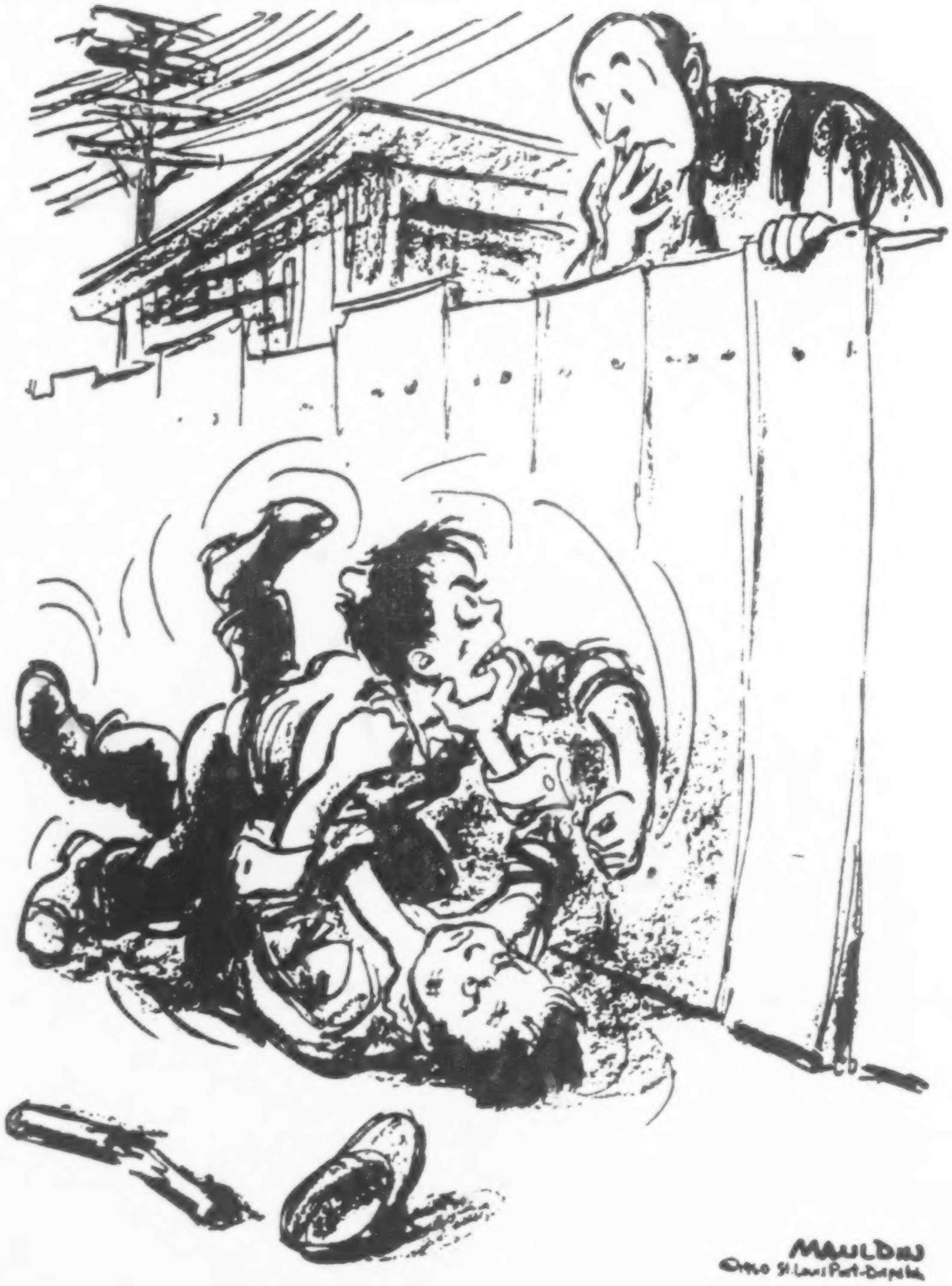


Figure 2, The Richardson Process
THE ORGANIC CYCLE OF WAR

attrition
armistice
outbreak of war
arms race
war-weariness
arms race
pause


MAULDIN
©1950 St. Louis Post-Dispatch

"HE STARTED A PREVENTIVE WAR AND I'M FIGHTIN' TO END WAR."

Figure 3. Arms and Insecurity
for overhead projection transparency

SUGGESTED PROCEDURES FOR SUBUNIT: 1914 AND 1962

This reading is intended to introduce the student to the arms "spiral", both upward and downward; the "tension plateau", a characteristic of the present, as well as past, cold wars; the tendency toward "showdown"; crisis and "brinksmanship" as techniques of national policy; the schizophrenia of contradictory roles; credibility; the difficulty of managing crises under threat; the narrowing of options; the "overloading" of communications channels, leading to breakdown and misunderstanding; faulty sequential data; and to raise the question of possible non-violent methods of conflict. Part I also should serve as a review of the concepts of alternative choices and strategies; the self-fulfilling prophecy as an aspect of the Richardson Process (see "Arms and Insecurity" subunit); and threat. Part II deals with the perceptions (and misperceptions) that Statesmen have and must confront in their confreres; the types of data available to decision-makers, and the problems thereof; content analysis as a technique of historical assessment; the use of the past to assist in understanding the future; and the stimulus-response syndrome. Part III investigates the problems of decision-making in more detail.

Distribute the Spring 1963 issue of Stanford Today. Stanford's Institute for Political Studies/Studies in International Conflict and Integration has, for more than a decade now, been applying rigorous scholarly analysis to international conflict, with especial emphasis on the pre-First World War period. This report, originally intended for Stanford alumni, outlines some of the work done and some of the tentative hypotheses and conclusions reached. The teacher should know that Professor Robert North is considered to be an eminent authority on conflict by his colleagues in the field, and both Brody and Holsti are approaching (if they have not yet reached) a similar respected status. This work is an indication of much concentrated, and still continuing, study.

All students should read Part I; sufficient time should be set aside for this. Those who become interested, those whose interest is sparked, and those who read faster than the average, should be encouraged to read Parts II and III. If the use of a simulation is desired, as an end-of-unit exercise, those who will probably take key simulated national positions should be strongly encouraged to go on to Parts II and III.

Questions about this exercise are legion. Approaches may take the following tacks, among others: Discuss the technique of content analysis. What are the limitations on the "content" available to political scientists?

What are the effects of a rise in tension during a crisis in relation to the number of decision-makers involved, the treatment of relevant information and the number of alternative courses of action?

Consider the importance of clear and accurate communication in the 1914 and Cuban (1962) crises. Was the difference in communications in the two cases vital to the outcome? Explain.

How is conflict present on all levels of human relationships? Give some examples of conflict resolved to work peaceably.

What advantages are there in using crises as a means of studying international conflict?

What use do you see for a "world thermometer" to measure tensions? Do you think the comparison of tension to a kind of fever threatening international health is justifiable?

How valid is Santayana's famous phrase, "Those who fail to learn from history are doomed to repeat it?"

Is it possible to compare historical happenings, since they never duplicate precisely the same situation, and the leaders are always different? What sort of information would we need to be able to answer that question? Where could we look for it?

The teacher is referred to Roberta Wohlstetter's monumental Pearl Harbor; Warning and Decision (Stanford, Stnaford University Press, 1962; paperback), especially chapter 7, "Surprise", for an excellent study of some of the problems of communication. C. Wright Mills, The Causes of World War Three (New York; Simon and Schuster, 1958; paperback), part I, "Do Men Make History" is rather provocative, and might be profitably read by some students.

This reading raises the question of alternatives in a forceful fashion. One is reminded of the dilemma which faced the Kennedy administration over possible arms escalation with the Soviet Union. One of the alternatives which Kennedy grasped was a cautious attempt at "signalling" de-escalation, chosen after the President read Charles E. Osgood's An Alternative to War or Surrender (Urbana: University of Illinois Press, 1962). Osgood suggests a strategy he calls "GRIT": Graduated Reciprocation in Tension-Reduction. As he puts it,

> I believe there is a way out of the dilemma of being either Red or Dead. It is not merely drifting along doing what comes naturally until fate decides the issue for us. It is not trying to erect stabilized deterrence on the shifting sands of human fallibility and hoping that it will somehow last forever. It is neither getting it all over with in an angry burst of hell-fire nor passively hoping for the best from an aggressive opponent as we lay down our arms. It is not merely keeping up the effort to reach negotiated agreements with the enemy, although such efforts should be continued. The way out, I think, lies in an approach quite novel for competing sovereign states: taking the initiative, not by creating threats and tensions but by reducing and controlling them. (PP. 85-86 of the paperback).

For a detailed explanation of this strategy, the teacher is referred to Osgood, chapter 5. Just let me note a point or two: Osgood calls the arms race "a kind of graduated & reciprocated, unilaterally initiated, internation action." (Italics in the original) It is, he says, a tension-increasing system. GRIT, in short, would be a flexible, self-regulating process "in which the participants carefully monitor their own initiatives on the basis of their own evaluation of the reciprocating actions taken by the other side." It would not be a willy-nilly, complete, sudden, unilateral disarmament. GRIT would seem, tentatively, to be the sort of action (among others, of course) taken by the United States during the Cuban crisis -- and responded to by the Soviet Union. Students might be encouraged to analyze and comment upon the specifics of such a strategy.

SUGGESTED PROCEDURES FOR SUBUNIT: THE IMPACT OF NUCLEAR WAR

There are those who consider a study of this aspect of war as "controversial", in that some young people, who may never have thought much about nuclear warfare before, or who may be especially sensitive, may recoil in horror from the very idea. It is true that there are some who will react in this way, of course. But it is also true that little meaningful effort to control warfare of this sort will take place unless and until concerned citizens, aware of the overwhelming impact of nuclear confrontation, take the lead. Such is the theme of this subunit.

Nevertheless, one should be careful not to overdo it -- there may be a negative outcome if the teacher is not frank and objective. Do not approach this with the idea of the macabre in mind.

For those who wish to think a bit more about this problem, see Hermann Kahn, Thinking About the Unthinkable (New York: Horizon Press, 1962), chapter I, "In Defense of Thinking", wherein he points out that, because of English Victorian delicacy, the problem of white slavery was long rampant, for such subjects were taboo.

There are some useful studies of the impact of nuclear war; Tom Stonier's (Nuclear Disaster: Cleveland: Meridian Books/World Publishing Co., c. 1964; in paperback) is one of the best, for his details are matter-of-factly handled, the material is readable by the average high school student, and his sources are unimpeachable. Stonier's approach is to detail the short- and long-term effects of a 20-megaton device exploded over Manhattan.

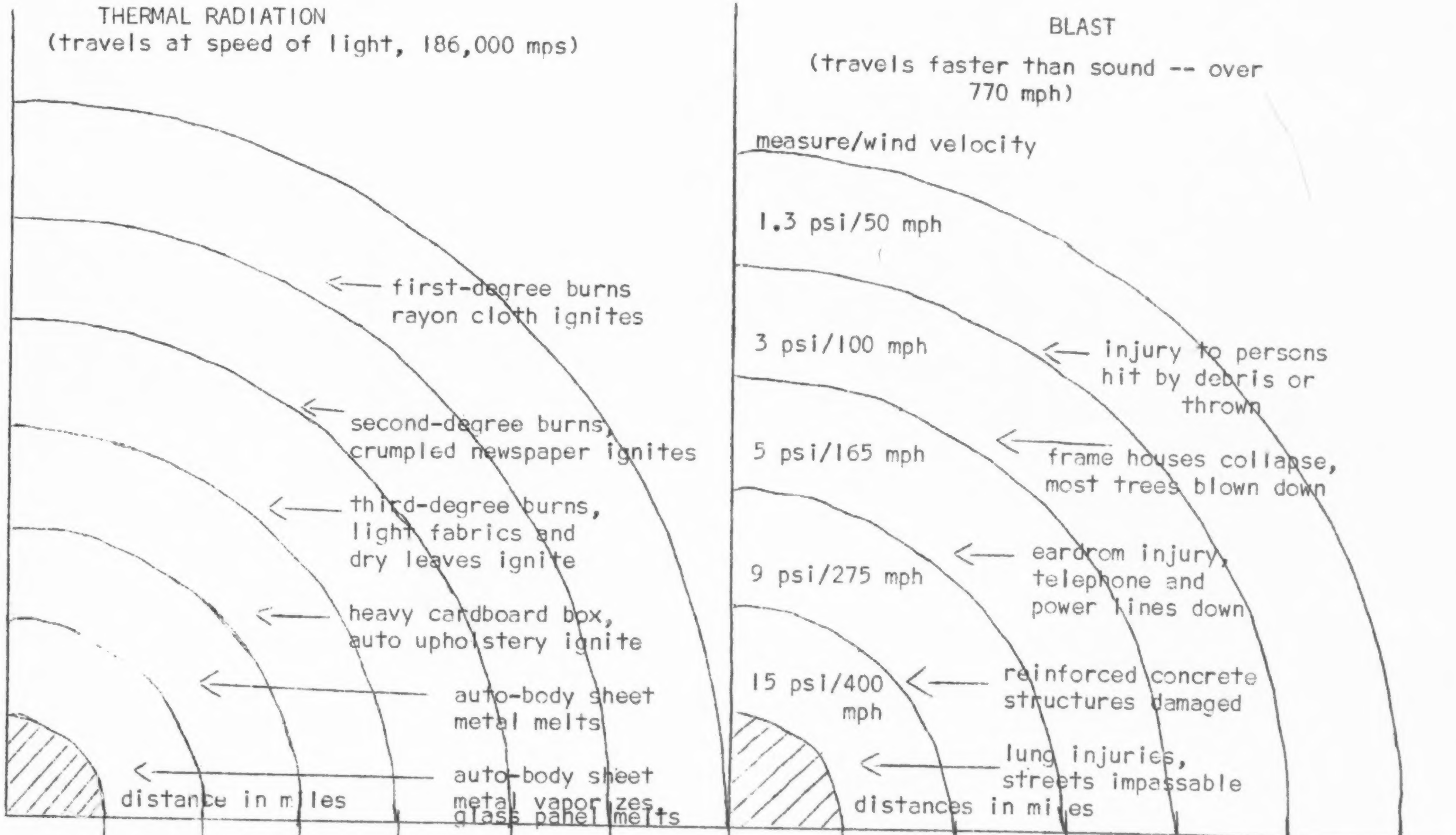
Figure I shows the thermal and blast effects of three types of hydrogen bombs (I megaton, I0 megatons, and I00 megatons) in miles, pounds per square inch overpressure, and wind speeds in miles per hour. An example: for a I0 megaton device, auto-body sheet metal vaporizes out to distances of 4 miles from blast center (or ground zero), first-degree burns will be received (and rayon cloth will ignite) out to distances of 35 miles, lung injuries will be sustained and streets will be blocked by rubble out to 3 miles from ground zero (where the overpressure will be I5 pounds per square inch and windspeeds of 400 miles per hour will be met), and winds of 50 mph, I.3 psi overpressure, and injury to persons hit by debris -- or thrown -- will be found out to a distance of I8.5 miles. All data are for air bursts (ground bursts will not have the same radii of effects, but residual radiation will be much higher). On figure 2, many of these distances are plotted on a map of the San Francisco Bay Area, supposing Treasure Island to be ground zero. The impact of a I0 megaton explosion is easily seen. As can be seen by comparing the two figures, the effects of a I00 Mt. blast are much greater. For Stonier's 20 Mt. device, increase the I0 Mt. effects by about 25% (the size of a 20 Mt. fireball alone is 2.25 miles).

Figure 3 shows the residual fallout pattern of a total of 3,000 megatons dropped on the United States. Variations, of course, can be expected due to meteorological conditions. The effect of some of these devices on various cities can be seen in figure 4. (Figure 4 does not deal with the effect of fallout). Students should fill in the "uninjured survivors" and "percentage of survivors" columns. Recent studies have indicated greater destructive effect; this is the reason for including Rathjens' figures from a recent Scientific

American article. Students should here fill in the "percentage of survivors" column. Figure 4 is for distribution to students; the others were originally intended to be used on an overhead projector, but student use is of course possible.

Such are the immediate effects (see also Stonier, chapters 1-3 and 5). But other effects are not here indicated and could become the basis of class discussions. (Relevant chapters from Stonier are indicated by parentheses.) Questions might include the following: What, offhand, would be the after-effects of a massive nuclear exchange? What would the first human reaction be (ch. 4)? What would this "fear and flight" mean to the individual caught up in panic? Do you see any long-range (and short-range) medical problems? (6,9) What, specifically? Where would the survivors obtain water? Food? Housing? (7) What might the social and economic consequences include? (8) (See also George R. Stewart's Earth Abides for a fictional speculation about the social consequences of a great human catastrophe.) What about the lasting effects of such a cataclysm? (10-13) See also the U.S. Atomic Energy Commission's The Effect of Nuclear Weapons, especially the 1962 edition. Hermann Kahn's On Thermonuclear War is also suggested. Local Civil Defense agencies (often the fire department in smaller localities) can provide students with much usable information.

The most important question -- and the most difficult, not to say most "controversial" -- might be: considering the immediate effects and future ramifications of nuclear warfare, under what conditions might it be in the national interest of the United States to consider nuclear warfare as a viable, or at least possible, option? What are the alternatives to nuclear warfare?

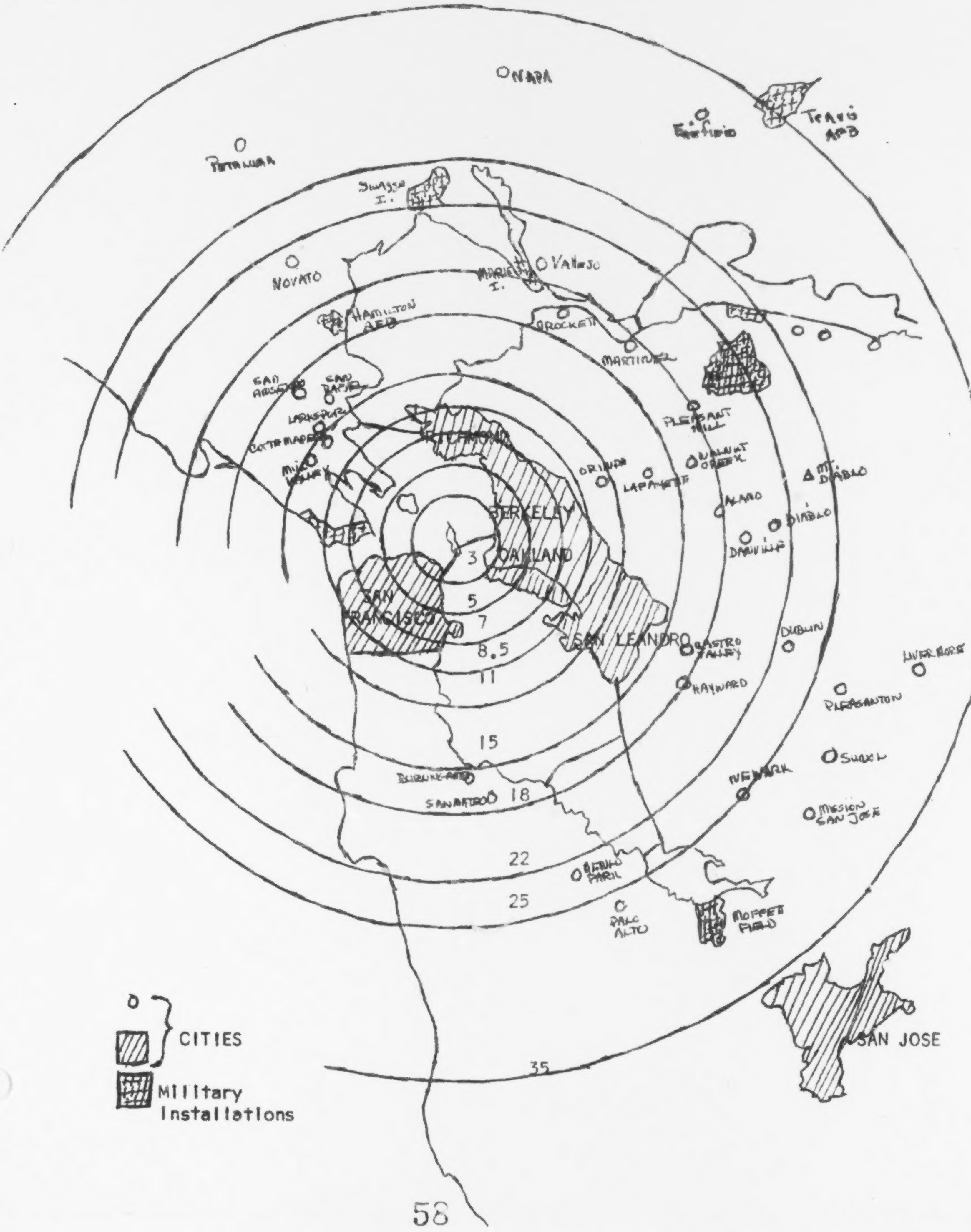

THERMAL RADIATION
(travels at speed of light, 186,000 mps)
first-degree burns
rayon cloth ignites
second-degree burns,
crumpled newspaper ignites
third-degree burns,
light fabrics and
dry leaves ignite
heavy cardboard box,
auto upholstery ignite
auto-body sheet
metal melts
auto-body sheet
metal vaporizes,
glass panel melts
distance in miles
BLAST
(travels faster than sound -- over
770 mph)
measure/wind velocity
1.3 psi/50 mph
3 psi/100 mph
injury to persons
hit by debris or
thrown
5 psi/165 mph
frame houses collapse,
most trees blown down
9 psi/275 mph
eardrom injury,
telephone and
power lines down
15 psi/400
mph
reinforced concrete
structures damaged
lung injuries,
streets impassable
distances in miles

1 Mt	1.5	2.7	5.5	8	9	13		1.4	2.6	3.9	5.3	8.8
10 Mt	4	7	15	22	25	35		3	5.6	8.5	11.3	18.5
100 Mt	11	19	45	60	70	100		6.5	12	18	24.5	40

(Mt=megatons, or yields of 1,000,000 tons of TNT: a hydrogen device) (all data for air bursts)

Figure 1, Impact of Nuclear War: THE EFFECTS OF NUCLEAR EXPLOSIONS

figure for overhead projector transparency


NAPA
FAIRFIELD
TRAVIS AFB
PETALUMA
SKAGGS I.
NOVATO
MARE I.
VALLEJO
HAMILTON AFB
CROCKETT
MARTINEZ
SAN ANSELMO
SAN RAFAEL
LARKSPUR
CORTE MADERA
MILL VALLEY
RICHMOND
PLEASANT HILL
WALNUT CREEK
ORINDA
LAFAYETTE
MT. DIABLO
ALAMO
DIABLO
DANVILLE
BERKELEY
OAKLAND
SAN FRANCISCO
SAN LEANDRO
CASTRO VALLEY
DUBLIN
LIVERMORE
HAYWARD
PLEASANTON
SUNOL
NEWARK
MISSION SAN JOSE
BURLINGAME
SAN MATEO
MENLO PARK
PALO ALTO
MOFFETT FIELD
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3
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25
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CITIES
Military Installations

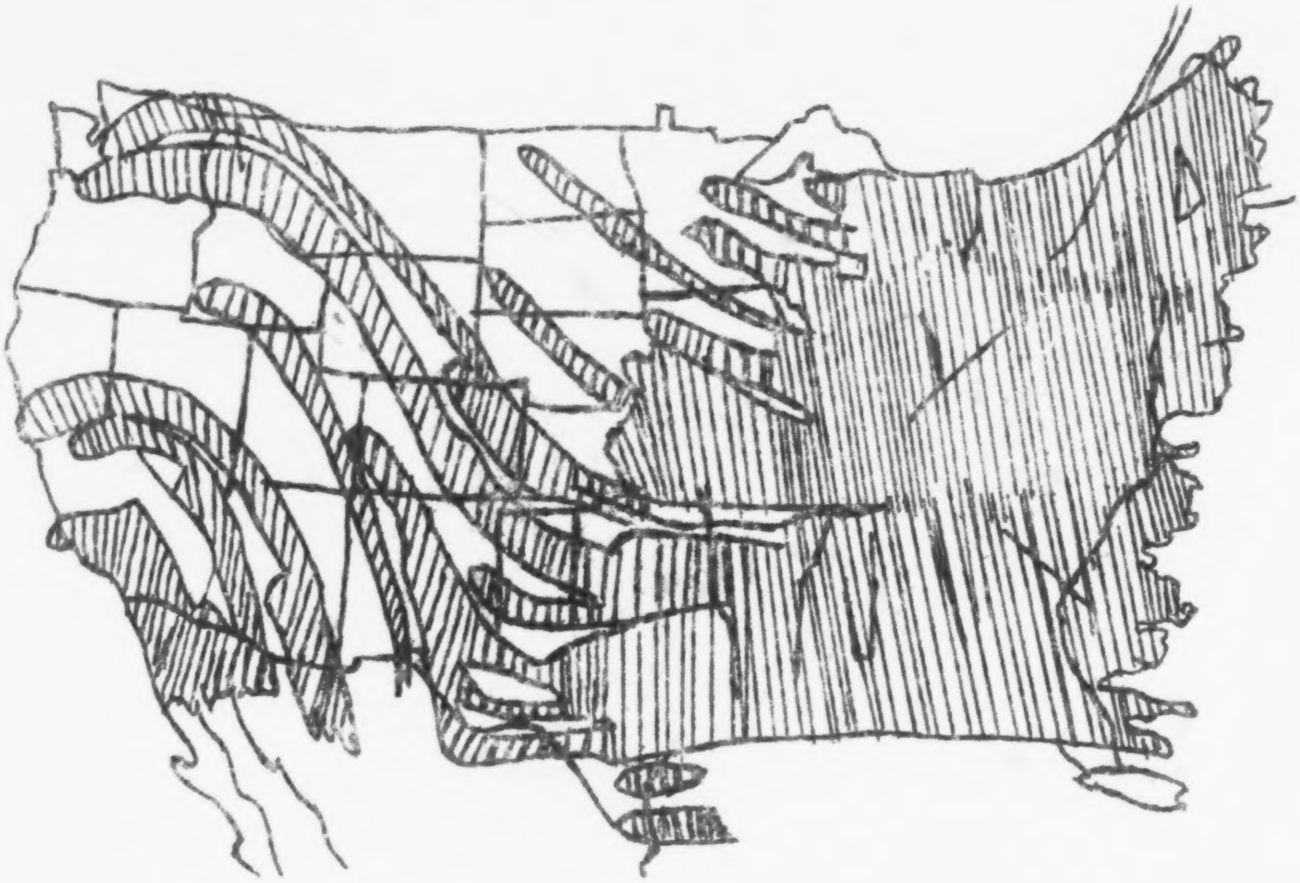


Figure 3, Impact of Nuclear War: TRANSCONTINENTAL FALLOUT PATTERNS

Pattern of fallout on the second day after a hypothetical nuclear attack upon the major targets in the United States on 17 October 1958. The meteorological conditions on that day would have produced the fallout distribution shown here.

Figure for overhead projector transparency

Figure 4, Impact of Nuclear War: CASUALTIES IN A NUCLEAR ATTACK

Target Area	Weapons*	Population	Number Killed (1st day)	Fatally Injured	Injured non-fatally	Uninjured survivors	Percentage survivors**
Boston	Two 10 Mt	2,875,000	1,052,000	1,084,000	467,000		
Chicago	"	5,498,000	545,000	447,000	648,000		
Detroit	"	3,017,000	820,000	593,000	557,000		
Los Angeles	"	4,367,000	698,000	2,136,000	814,000		
New York	"	12,904,000	3,464,000	2,634,000	2,278,000		
Philadelphia	"	3,671,000	1,309,000	989,000	777,000		
San Francisco	One 10 Mt One 8 Mt	2,241,000	734,000	769,000	301,000		
Wash. D.C.	One 10 Mt One 8 Mt	1,465,000	579,000	433,000	228,000		
Portland	One 10 Mt	705,000	156,000	103,000	131,000		
Seattle	"	732,000	168,000	99,000	126,000		
Denver	One 8 Mt	564,000	138,000	144,000	118,000		
San Diego	"	557,000	58,000	202,000	126,000		
Total within target areas		68,460,000	18,556,000	16,825,000	11,009,000		
Total outside target areas		82,239,000	1,095,000	5,354,000	6,182,000		
Grand total		150,699,000	19,651,000	22,179,000	17,191,000		

Source: 1959 Congressional hearings on nuclear war
*Mt=megatons. Total value of attack, 3,000 megatons.
**Survivors includes both injured non-fatally and uninjured.

George W. Rathjens, in his article "The Dynamics of the Arms Race," *Scientific American*, CCXX #4 (April, 1969), p. 23, gives the following figures: (hypothetical nuclear exchange in the mid-1970's)

	deaths***	probable deaths***	survivors***	percentage of survivors
if the USSR struck first #	90	5	105	
if the USSR struck first #	50	30	120	
if the USA struck first ##	25	15	160	
if the USA struck first##	20	10	170	

These figures are based on two different "damage-limiting postures"
These figures are based on two different "damage-limiting postures"

Figure for student use

THE HIGH CHANCE OF NUCLEAR WAR

by William H. Willson

William Willson is a former
Deputy Director of Intelligence
in the Canadian Navy, and is
now a systems analyst in California.

The probability of nuclear war in this decade is at the highest point since the dawn of the atomic age. Although the Vietnam war could lead directly to nuclear exchange, settlement of this dangerous conflict is not likely to reduce the overall odds.

In 1948 after the Hiroshima and Nagasaki experiences, world apprehension over nuclear weapons affected every international situation. The fear of war by accident caused nations to avoid military confrontations no matter how frenzied the politics of the cold war became.

While the probability of nuclear or megawar was significant, great care was taken to avoid conflicts of the Korean and Vietnam scale that we know today. Similarly, frantic effort was made to isolate and contain what I shall call miniwar situations such as the Middle East which involve the territories of small nations and the interests of major powers.

By 1958, we had survived the Korean confrontation without the feared detonation of nuclear weapons. The major powers were still committed to a policy of nuclear retaliation, but public opinion was no longer obsessed with the H-bomb. The world began to believe that total war could not occur.

Still there were ominous signs. The number of incidents or "microwar" situations increased in frequency. The breaking up of the old empires and the sudden emergence of new nations multiplied the number of conflict points. Thus, the probability of a Korean-type war became as great a possibility in 1958 as the smaller mini-wars had been in 1948.

Today, the situation has taken a subtle and dramatic turn. The number of new nations is still expanding and the number of nations possessing nuclear weapons continues to increase.

Military adventurism has grown and 1968 reveals not only an acceptance that the Vietnam and Korean wars are of a "safe level," but nuclear weapons are being viewed as a solution to desperate military and political predicaments

The possibility that there is one more step before nuclear war -- a world war of conventional weapons -- no longer exists. The defense of Europe and the ultimate defense of American forces in Vietnam are already predicated on the use of tactical nuclear weapons.

It is an illusion to believe that tactical and strategic nuclear weapons permit a new intermediate plateau of belligerence. Given the present state of

TYPE	WEAPONS	SCALE	CASUALTIES	CHANCE
MICROWAR	ESPIONAGE, THREAT, TRIBAL WARS, COUPS e.g., U-2, Pueblo	SIMPLE WEAPONS COMPLEX SENSORS	2-20	100%
MINIWAR	NATIONALIST WARS, CIVIL WARS e.g., Mideast, Dominican Republic	SMALL ARMIES, CONVENTIONAL WEAPONS	20-2,000	90%+
MONOWAR	LIMITED WARS OF IDEOLOGY, NATIONALISM e.g., Korea, Vietnam	LARGE ARMIES, SOPHISTICATED WEAPONRY	2,000-2 million	80%+
MESOWAR	UNLIMITED WARS OF IDEOLOGY, NATIONALISM e.g., World Wars I, II	TOTAL MOBILIZATION	2 million-20 million	5%
MEGAWAR	NUCLEAR WAR	ATOMIC BOMBS, HYDROGEN BOMBS	20 million-2 billion	10%-40%

WARFARE SITUATIONS, PROBABILITY OF OCCURRENCE IN THIS DECADE the public mind, they cannot be differentiated. The psychological consequences alone that would result from the use of any nuclear weapon, however limited, militates against such thinking.

In 1968 then, the probability of wars like Vietnam leading to nuclear war has risen sharply. And we may soon expect that even miniwar situations will contribute to the pressure on this upward threat.

To understand the forces compelling this 30-year progression toward destruction, certain basic assumptions of human behavior must be pointed out.

The actions of men are not guided by facts but by the interpretations men place on the facts. Since the beginning of human history, decisions on issues have been complicated by ethics, a concept of virtue fighting vice. This is universal, and the particular moral concepts that have governed and incited human antagonisms are relevant to each war situation throughout history.

Tribal life produced conflicts over food, and possessions, but the rationale for the quarrels exceeded the mere problem of distributing limited resources.

When man discovered the economy of cooperation, conflict was enlarged to include the protection of lands and cultures. But the rationale of "good" overwhelming "evil" remained the same.

Later, man's pugnacity was transferred to still larger groups in the form of cohesive empires, but the battles were still fought in the name of God and virtue.

This movement toward larger social groupings might have evolved into the kind of global community that world federalists speak of, but it was complicated by ethical beliefs that crossed national borders -- religion, ideology, race, economics.

The transfer of animosity from state to sect produced the religious wars. The 20th century witnessed competing ideologies, struggles between democracy and fascism, capitalism and communism.

Race is a growing source of friction, as is the gap between wealthy and poor nations and peoples. The poor see the rich as powerful and evil, and the rich see the poor as lazy and evil.

It can be seen that while the excuses for conflict change, the driving force remains man's inclination to attribute real problems to the evil objectives of other men.

In an era that has produced its own unique changes, the concept of "righteous" policies instead of consideration of competing alternatives must inevitably lead to total war.

Those who have been able to see beyond the ideological conflicts of the day have pointed to these immediate conditions that influence the probability of war:

*Man in the machine age is experiencing individual personality conflicts between the dehumanizing demands of the machine and his spiritual and creative nature.

*Nationalism has been diluted by a polarization of social groups and antipathy between these groups. This reduces the number of issues on which national unity can be achieved.

Conclusion: the nuclear power of the world is in the hands of societies under the greatest pressure of these two forces.

*The interdependency of world trade prevents advanced nations from isolating themselves from one another in order to achieve internal unity and stability. Their prosperity depends on it.

*The failure of the money tool to provide a satisfactory means of distributing the surplus of affluent societies and the vulnerability of free enterprise to disruption has become apparent.

Conclusion: Nuclear power can be applied in any direction and for any reason, depending upon what group holds the trigger and what it sees as its vital interest.

But the overriding factor that makes turmoil and conflict a certainty in human events of the future is the pressure of population. The other problems can be solved with time. The population problem denies us this time.

In the last century, the population of the world increased by a greater amount than the total in the previous 19 centuries. Today this pressure is relentless and it raises the probability of nuclear war in two ways.

First, if the struggle of underprivileged masses seeking survival continues to be seen as a struggle between respective ideologies, nuclear war could occur when one nation finds its situation so frustrating that in anger it strikes out at a nuclear enemy, either real or imagined.

Second, the misconceptions that have prevented the affluent powers from acting in concert to limit world population could result in their launching nuclear strikes against the masses when no other means of relieving the pressure is available.

There is a third possibility. The degeneration of the societies which now control nuclear power could result in paralysis which could preclude any attempt to stem the onrushing peoples. Thus, there could be a return to the Dark Ages, with the virtual certainty of nuclear weapons falling into even less responsible hands.

We have a situation of power in unstable hands, complicated by traditional misconceptions and false doctrines, further complicated by the rapidly deepening crisis of population increase.

The easing of the population problem is the main prerequisite to a return of the war probability graph to something approaching the 1958 curve.

Not one, but a number of miracles must occur for this to take place and the most optimistic philosopher would be hard put to see any sign of even a little miracle.

--Los Angeles Times, as reprinted in the San Francisco Chronicle, March 31, 1968.

SUGGESTED PROCEDURES FOR SUBUNIT: PLANNING FOR THE FUTURE

This exercise has a twofold application: in the short run, it is to ready the students for what will be a practical application of their knowledge, the simulation, which is the very heart of the entire unit; but more than that, this is intended to give the student insight into the compelling problem of attempting to face an unknown future confidently, in that he should be able to chart a rough course of the possible futures we face, and to be able to make some fairly rational decisions in anticipation of those futures.

Distribute the reading by Brownlee Haydon, "The Year 2000" (mimeographed MS., AD 650501, Defense Documentation Center.) This reading will probably take from 30 to 60 minutes to read, and may be given as homework.

Many questions and lines of inquiry approach will be obvious from the reading. Haydon, the Assistant to the RAND Corporation President for Communications, gave this paper to the Chevrolet Academy at Wayne State University in March, 1967.

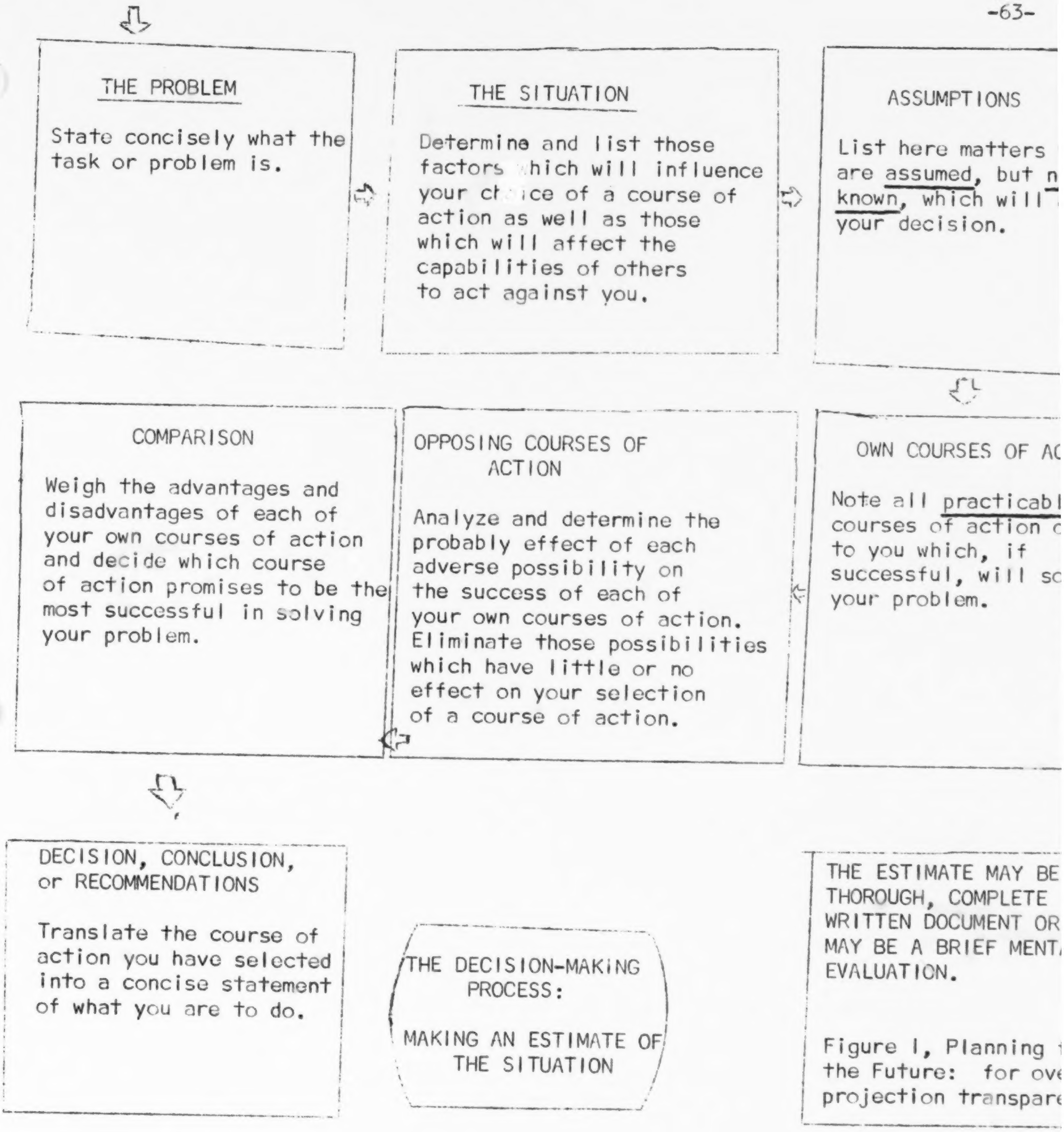
Some suggested questions: What was the real secret of the ancient Delphic "technique"? What groups of thinkers are seriously interested in possible alternate futures? Why? What are the reasons for undertaking a serious study of the future? What are the "extremist" points of view to be avoided? What are some of the possibilities we may see developing by 1984? List the danger signs we see looming in the future. What are some of the changes which we may expect that will significantly change the life-patterns of mankind? How will education have changed by the year 2000?

What will private life be like by 2000? How may communication have changed? What, according to Haydon, is the likelihood of major war by the year 2000? What about the emergence of China?

What should we want to know, what should we learn, what points of view should we consider in order to be able to cope with the world as it may be 30 years from now?

We have found the technique of analysis to be a very useful one, not only in considering the future, but also the past. For that reason figure I is appended. This is one of the possible processes of decision-making, known as the "estimate of the situation." It is a very logical process. We have used it often, and fruitfully. On occasion, we have given each member of the class an assignment like "consider the options the President had in the Cuban Missile Crisis." "Make an estimate of the situation regarding phasing-out the war in Vietnam." Five suggestions are appended.

This technique may be used in a variety of ways: individual analysis, group action, or a combination of both. Occasionally students are asked to do the initial work as individuals (statement of the problem, description of the situation, lists of assumptions, list of own courses of action), and the final work in small groups (analysis of opposing courses of action, comparison of own courses of action, and decision or conclusion). This technique has proved to be a valid one, whether discussing Lincoln's options or Truman's.



THE PROBLEM

State concisely what the task or problem is.

THE SITUATION

Determine and list those factors which will influence your choice of a course of action as well as those which will affect the capabilities of others to act against you.

ASSUMPTIONS

List here matters are assumed, but n known, which will your decision.

OWN COURSES OF AC

Note all practicabl courses of action c to you which, if successful, will sc your problem.

OPPOSING COURSES OF ACTION

Analyze and determine the probably effect of each adverse possibility on the success of each of your own courses of action. Eliminate those possibilities which have little or no effect on your selection of a course of action.

COMPARISON

Weigh the advantages and disadvantages of each of your own courses of action and decide which course of action promises to be the most successful in solving your problem.

DECISION, CONCLUSION, or RECOMMENDATIONS

Translate the course of action you have selected into a concise statement of what you are to do.

THE DECISION-MAKING PROCESS:

MAKING AN ESTIMATE OF THE SITUATION

THE ESTIMATE MAY BE THOROUGH, COMPLETE WRITTEN DOCUMENT OR MAY BE A BRIEF MENT EVALUATION.

Figure I, Planning the Future: for ove projection transpare

OPERATION FREEDOM FIGHTER

You are a Pentagon analyst in the War Plans Division of the Office of the Joint Chiefs of Staff. It is late October, 1956, and the situations in Hungary and Suez are just unfolding. You are asked to draw up a list of rational, reasonable American actions, and analyze the opposing courses of action.

OPERATION BAY OF PIGS

You are a State Department analyst on the Latin American desk. Working closely with the CIA, you are asked to analyze the possibilities stemming from the proposed action that will take place shortly in Cuba (it is April 4, 1961), and make recommendations to the CIA Project Chief. What are your actions at this time?

OPERATION LHASA

You are an analyst in the War Plans Division of the Office of the Joint Chiefs of Staff. The date is now. Intelligence reports indicate a sudden influx of Red Chinese troops into the Northern areas of India; at the same time, fighting breaks out between the Indians and the Pakistanis in Kashmir. It seems that the Russian Military Attache approaches you at a cocktail party in Washington and suggests that the two of you analyze the possibilities for joint action. You decline, but rush to the Pentagon to think.

OPERATION CHARLEMAGNE

You are on the North American desk of the State Department early one morning when an AP Flash arrives: Quebec has seceded from Canada and petitioned France for aid and the right to become a French province. It is reported that Orly field near Paris has been closed, and there are reports that France has asked Greenland for refueling rights for a group of Canada-bound transports. Canada is calling up its reserve forces. What do you report to the Secretary of State?

OPERATION BIAFRA

The civil war in Nigeria is escalating. Biafra has asked Red China for volunteers; Nigeria has asked for British troops; bloodshed is rife. You are on the African desk of the State Department. How do you analyze the situation for the Secretary of State?

THE YEAR 2000

Brownlee Haydon
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If I live to be as old as my father, I will live to see the year 2000. As I look around me, I see that most of you, with reasonable luck and a certain amount of good behavior, will also live that long. At the beginning of this century, life expectancy for the average American male was about 46 years. By 1950, this had risen to 65 years. At the rate life expectancy is rising, and considering how much above average you are in income and standard of living, if you are now between 40 and 50 you can probably expect to peer, with dwindling interest, into the next century.

Never before in history has man been able to look as far into the future as he can today, and with as much confidence that he will have something to say about what his future will be like. No longer does he scan the heavens for signs. The future is in his hands, in his work, here on Earth. You may recall from Shakespeare, the conversation between Brutus and Cassius who were trying to explain Caesar's greatness and power:

> Men at some time are masters of their fates:
> The fault, dear Brutus, is not in our stars,
> But in ourselves, that we are underlings.
> -Julius Caesar (I.ii.136)

Earliest man looked to the stars for portents of things to come, and read ominous warnings in eclipses, earthquakes, and droughts. The art of foretelling the future lay primarily in the hands of the priests and soothsayers. In Ancient Greece, as early as the 7th century B.C., the gods spoke to men about their fate through the priests at Delphi. Although much has been written to show that the benign guidance of these priests helped establish the Greek Empire, and even led to ethical and moral reforms, the Delphic Oracle was really an elaborate con game. We now know that during the month-long waiting period imposed upon those who came to Delphi for advice, an elaborate intelligence game was conducted to assist the priests in giving good answers. And when this trick was found out, and applicants began to give false information to mislead the priests, messengers were dispatched to their home towns to gather information that would help the priests make more plausible predictions. So much for the past.

Today you can open the newspaper almost any day and read some startling prediction about the future. A few samples:

> "Sea Living for Humans Envisioned"
> (In the years to come, the story reads, many young Americans may go to school for weeks on end in watertight, pressurized 'campuses' built on the bottom of the sea.--UPI 1/23/67 Petroleum Today article reported in L.A. Times.)

"Driverless Auto Seen Available in 15 Years"
(Ohio State, Dr. Robert Cosgriff. 12/11/66
L.A. Times)

"Good Soil in the Arctic"
(Cover barren ground with black cracked asphalt, raise temperature, lengthen growing season. Toronto Globe & Mail, 2/7/67.)

"Food from Crude (Petroleum) May Feed the World."
(Standard of N.J. & Nestle Alimentana S.A., pilot plant and animal tests of proteins from petroleum. Toronto Globe & Mail, 1/30/67.)

The future has become so much a part of our present that it has become respectable to speculate on almost any trend or tendency. Scholars of great eminence, supported both by the foundations and by the Government, are seriously engaged in attempts to foresee the future. Did you know that there is a World Future Society in this country, and that it publishes a "Newsletter for Tomorrow's World" called The Futurist. The American Academy of Arts and Sciences has appointed a 31-man Commission on the Year 2000. It began its work in 1965, and has already held several seminars; its speculations will soon be made public in a book. An Institute for 21st Century Studies has been formed at Ball State Teachers College, Muncie, Indiana. Mankind 2000 has offices in Vienna, London, and the Hague. Bertrand de Jouvenel, the distinguished French scholar, has formed an organization called "Futuribles" -- which may be translated "possible futures" -- that is supported in part by Ford Foundation money.

I have a list of two dozen more organizations and institutes that have come into being during the last decade to conduct studies of the future. Lest you think that this is the work of crackpots, let me make a general statement, and illustrate it with some examples: there is probably no major industrial or business organization that does not have a long-range planning group at the very highest level of management. For example, the General Electric Company created a long-range planning group 10 years ago in Santa Barbara. It is called TEMPO. Westinghouse has a long-range planning group. Every major automobile manufacturer has long-range planners reporting to top management. A few months ago a major publisher of magazines visited RAND to talk to our professional staff about whether there will even be printed magazines by the end of the century. Otis Chandler, publisher of the Los Angeles Times, was recently quoted as saying: "...a quarter of a century hence the daily newspaper as we know it may have ceased to exist, possibly being replaced by some kind of teleprinter device in the home." Even the New York Times, a fairly conservative paper, has created a Committee on the Future, staffed by senior editors. Says the Times: "It sits as a kind of Delphic Oracle, peering through the tightly woven fabric of the future."

There are two good reasons why it is important for man to look into the future. First, he may identify things he is now doing that he must stop doing if he is to servive at all, or have a world worth living in. I will cite some examples later. Second, he must project as far into the future as he can some of the things he may be considering doing, or may do accidentally, to see whether these will have serious and perhaps irreversible consequences for the welfare of mankind. I will give some illustrations in a few moments.

Before I try to select a few characteristics of the world of 2000, and explain how they are derived, and how they may affect you, it may be useful to say something about the art of conjecture. At the one extreme, probably the most unreliable, is the crystal ball. You can buy one in any magic shop and do about as well as the local gypsy. At the other extreme is the computer-equipped scientist who tells you with self-claimed infallibility how some trend is likely to go, complete to several decimal places. We would be well-advised to ignore both of these extremists. In between are the scholarly specialists who write wisely about alternative states of the world as they project interacting trends forward in time, taking into account the uncertainties inherent in basic assumptions that must underly all predictions. If you read their conjectures, including the footnotes and the qualifying phrases, you can accept most of what they say. And having examined their premises, formed some estimate of their sensibleness, you can decide for yourself whether the ideas are overcautious or far-fetched.

Still another way of looking at the future has been developed by colleagues of mine at the RAND Corporation, Drs. Olaf Helmer and Norman Dalkey. Twenty years ago, they suggested that it might be possible to get a better notion of what lies ahead if you ask a panel of experts to give their opinions. The idea is inherently logical, but it attracted little attention at the time. They made a few pilot tests that satisfied them that the idea had promise. Helmer and Dalkey call this the "Delphi technique."

A few years ago a study of long-range forecasting was undertaken at RAND, under the guidance of Dr. Helmer and Ted Gordon of Douglas Aircraft. Despite anything you may have read in the newspapers about the future depicted by this study, it was undertaken to test a refinement in the Delphi technique and not as an attempt to predict a future world. Their predictions were merely an interesting by-product of the study.

This study involved more than 80 experts -- engineers, mathematicians, economists, physical scientists, social scientists, writers, and so on. They were placed in panels to examine the future in six areas: scientific breakthroughs, population growth, automation, space progress, the probability and prevention of war, and future weapon systems. The participants were given questionnaires and their anonymous predictions were reported to their fellow panelists. Each was then given an opportunity to alter his own predictions. Along the way, each was asked to justify his ideas. This was done several times. Through this feedback, an attempt was made to obtain consensus. Through the exchange of information there was an appeal to logic and reason, but because the panelists remained anonymous there was no appeal to authority.

Let's begin our survey of the year 2000 by noting what these panels of experts thought about the world of 1984. (If we were to jump to the year 2000 we would leave out some interesting things we can expect to encounter during the next 30 years.)

Transplantation of natural organs and implantation of artificial (plastic and electronic) organs will be common practice. Personality-changing drugs will be widely used.

Sophisticated teaching machines will be in general use.

Automated libraries, which look up and reproduce relevant materials, will greatly aid research. We will have automatic translating machines, coupled with universal satellite relay systems for world-wide communication.

In space, a permanent lunar base will have been established. Manned Mars and Venus fly-bys will have been undertaken. Deep-space laboratories will be in operation. New sources of power will be available using solid-core nuclear reactors and ion engines.

In the military arena, we can expect advances in non-lethal biological and chemical agents, lightweight rocket-type personnel armament, small tactical nuclear weapons, and direct-energy weapons of various sorts. Anti-submarine warfare techniques will have been devised, but improved, deep-diving and hard-to-detect submarines will present new problems.

All that is on the road to the Year 2000. For that year, the Delphi panels arrived at a consensus on the following:

The world's population will have risen from 3.3 to 5.1 billion.

New food sources will have been opened up through large-scale ocean farming and the fabrication of synthetic protein.

Controlled thermonuclear power will be a new source of energy. New mineral raw materials will be derived from the oceans. Regional weather control will be past the experimental stage.

General immunization against bacterial and viral diseases will be available. Primitive forms of artificial life will have been generated in the laboratory. The correction of hereditary defects through molecular engineering will be possible.

Automation will have advanced farther, from doing many mental chores to performing some rather sophisticated high-IQ functions. A universal language will have evolved through automated communication.

On the Moon, mining and manufacture of propellant materials will be in progress. Men will have landed on Mars, and permanent unmanned research stations will have been established there, while on Earth, commercial global ballistic missile transport will have been instituted.

Weather manipulation for military purposes will be possible. Effective anti-ballistic missile defense in the form of air-launched missiles and directed energy beams will have been developed.

Since you may have found one or more of these predictions a little hard to accept, let me remark that I would probably agree with you. Remember, we are dealing with a consensus of experts, and the experts have often been wrong. At the turn of the present century, even the most distinguished of scientists felt that anyone who tried to build an airplane was a fool. The great American astronomer, Simon Newcomb, wrote:

> "The demonstration that no possible combination of known substances, known forms of machinery, and known forms of force, can be united in a practical machine by which man shall fly long distances through the air, seems to the writer as complete as it is possible for the demonstration of any physical fact to be."

Even after the first airplanes were flying, William H. Pickering, another astronomer, wrote:

> "The popular mind often pictures gigantic flying machines speeding across the Atlantic and carrying innumerable passengers in a way analogous to our modern steamships....It seems safe to say that such ideas must be wholly visionary, and even if a machine could get across with one or two passengers the expense would be prohibitive..."

Twenty years ago, Dr. Vannevar Bush, civilian chief of the U.S. scientific war effort, was not impressed with the performance of the German V-2 rockets. He told Congress:

> "There has been a great deal said about a 3,000 mile high-angle rocket. In my opinion such a thing is impossible for many years. The people who have been writing about these things that annoy me, have been talking about a...rocket shot from one continent to another, carrying an atomic bomb...I say, technically, I don't think anyone in the world knows how to do such a thing...."

I think this is a lesson that applies both to those who are certain that something is impossible, as well as to those who are sure that something will happen. I could entertain you for quite a while with just an enumeration of things that may be possible by the Year 2000. I would prefer, however, to discuss a few of the problems that advancing technology -- as well as the blind processes of Nature -- pose for civilized man.

Probably the most serious problem of all is over-population. This is a problem that in my view will either be solved by the use of common sense, aided by science, or by famine, plague and war, or by a combination of all three. Dr. Lloyd Berkner, distinguished physicist and mathematician, writing in the Bulletin of the Population Reference Bureau, makes a simple projection of available food supply (measured in calories), and world population, and calculates how much each of us will have to eat. Like all such projections, it makes some simplifying assumptions. On balance, I think it makes sense, however. World food supply has been rising at an average rate of 1 per cent per year, while world population has been rising at about 1.8 per cent per year. In 1965, Dr. Berkner says, the 7 trillion calories divided among 3.3 billion persons allows an average of 2,121 calories per person per day. (You and I had more than that, but several million persons die each year of starvation, too. We are talking about averages.) By 1980, some 8.1 trillion calories divided among 4.5 billion persons would give each an average of 1,800 calories daily.. By 1990, food production would have increased to nearly 9 billion calories, but each of the 5.7 billion persons would get only 1,575 calories a day. By the Year 2000, with food production up to 9.9 trillion calories, and a world population of 7.4 billion, the average amount per person would be only 1,340 calories a day -- not enough to sustain life. Since we know that this calorie ouput would not be properly balanced among starches, proteins, and fats, and certainly unevenly distributed, we can be sure that long before the Year 2000 there would be widespread starvation, disease and revolution -- unless population growth is slowed. Fortunately, there are signs that such projections are more alarming than real. Man is not stupid, and there are ways to increase the world's food production and to slow population growth. Faced with the hard realities of famine, we may be sure that drastic actions can and will be taken. But you will hear arguments on both sides, for years to come. Those who believe it is easy to produce enough food to feed twice or ten times the number of persons alive today will argue, as the director of the Stanford Food Research Institute does, against birth control and against making other nations into "sex clinics." Some people would rather control population than eat a diet that includes proteins made from oil. A government researcher in the Bureau of Commercial Fisheries has estimated that the oceans can feed 10 times the present world population. He believes that the ocean harvest can be increased from the 54 million metric tons of 1964 to a steady annual rate between 500 million to 2 billion metric tons -- without depleting the ocean's stocks. (Science News -- 2/18/67.)

Straight-line extrapolation into the future is dangerous and misleading. For example, take this line of reasoning:

In 1900, the United States could count only one scientist-engineer for every 1800 persons in the population.

By 1950, the ratio had fallen to one scientist for every 300 persons.

It is predicted that the ratio will be one-to-ninety in 1980, and one-to-forty in the Year 2000.

At that rate, it seems clear, everyone will be a scientist sometime in the next century. But that is plain nonsense.

The President of the National Academy of Science predicted in 1963 that by the end of the century -- by 2000 -- our nation might be devoting from one-fourth to one-half of its gross national product to research and development. This simple-minded -- and obviously wrong conjecture -- was obtained by making a straightline projection based on the recent rate of growth in R & D expenditures. (F. Seitz, Physics Today, 16, No. 12, 29(1963).

In the 1967 report of the President's Council of Economic Advisors there is this breathtaking sentence: "If the American economy continues to grow at 4 per cent a year, output will double in 18 years, triple in 28, quadruple in 35." Translated into dollars, that would mean that gross national product, which was 740 billion in 1966, would be 1 trillion dollars in 1972, and by the year 2000 would be nearly 3 trillion dollars!

You can make equally wild conjectures by drawing most trend lines far enough into the future, whether it is crime statistics or the divorce rate. The truth is, circumstances change and we must use judgment in projecting trends. Furthermore, we must look for interactions between competing futures, and make decisions with respect to actions we may take to affect the outcomes.

I mentioned earlier two compelling reasons for looking into the future as far as we can see:

To detect danger signals, so that we can begin to take actions to forestall unpleasant events or conditions, and

To avoid making some foolish mistakes.

Let me give some examples. In the first category, let us consider the use of pesticides. Most of us were brought to an awareness of this potential hazard to mankind by Rachel Carson's Silent Spring. I do not intend to take sides on this matter, but merely cite the issue it involves as one that must be seriously examined to guarantee that we do not do things today we will forever regret. We are as yet profoundly ignorant of the effects of our use of pesticides, in the broadest sense. We know that they make their way into the rivers and are carried to the oceans. Here they are concentrated by the tiny-single-celled algae known as diatoms, which are eaten by fish. We already know that some fish are loaded with pesticides -- we don't know whether this is bad for them or us. But we also know that our supply of atmospheric oxygen comes largely from diatoms; in fact, they replenish all of the atmospheric oxygen every 2000 years as it is used up. So we must worry a little, at least, about whether the use of pesticides is reducing our supply of diatoms or forcing the evolution of less productive mutants, because we might be starting to run out of atmospheric oxygen. That's one way our atmosphere could become lethal.

Another way is for us to contaminate it. One meteorologist has gone so far as to predict that by the 2025, the air will be so polluted that we will all die of asphyxiation. I don't take that kind of prediction seriously and neither should you. What it does is sound an alarm. It tells us that we must act now if we are to avert a serious crisis later.

You are aware that more than one forecast has been made that the days of the internal combustion motor are numbered -- that it will be replaced by the electric car, and sooner than most persons think. We know that the automobile and the refineries are prime contributors to smog, but not the only ones. We also know that the primitive control devices now in use are inadequate. It is a local joke that researchers at General Motors who are studying smog must first filter the air they use in their experiments before mixing it with automobile exhaust and irradiating it with their solar ultraviolet.

We know that polluted air is bad for people, plants, and materials. We know that it has changed the weather over urban areas, but we do not yet understand completely how or how much it is affecting our climate, or the balance of nature.

A European moth, found in the industrial city of Birmingham, England, has changed from light to dark in the last century, to better match its smokey environment and escape preying birds.

Many precious statues, of limestone and marble, are being slowly destroyed by the sulfur dioxide in urban air -- the SO_2 is oxidized and hydrated into sulfuric acid which attacks the stone. Somewhat similar processes are at work on the priceless frescoes in the churches of Italy and France.

Last but not least, we know that urban air carries hazards to health. We do not yet know whether or in what way it may be related to cancer, asthma, emphysema, and bronchitis, but we suspect a connection.

We are told that air pollution affects 6000 communities now. We are told that by the end of the century pure air may be one of our scarcest resources. What this means, of course, is that we must do something, and do it soon, if we are to have an atmosphere that is fresh and healthful in the year 2000.

Let me read a few passages from a column by a science editor in the Los Angeles Times: "If man wants to go on living on the Earth he is going to have to stop burning fossil fuels (coal, oil, gasoline, etc.) and do so almost completely and almost at once." (March 2, 1967).

He said nuclear reactors must be substituted for the coal, oil, and gas furnaces that operate factories and power plants today. Most important, the internal combustion engine -- the basis of the automotive civilization of present day North America and Europe, must be abolished. Trying to control the emissions -- by adding devices to engines or improving the efficiency of burning -- will not work.

Driving an automobile 25 miles uses up more breathable air than 7,000,000 people will use in the same period of time. Carbon dioxide in the atmosphere will be 25% greater in the year 2000 than now. We are told that we must substitute nuclear reactors for fossil fuel energy sources -- well -- The prospect of new and more efficient nuclear power sources carries with it both a promise and a threat. On the one hand, advancing technology promises unlimited power from plutonium-fueled fast-breeder reactors that produce more plutonium than they consume in the generation of energy. In addition to cheap, virtually inexhaustible supplies of energy, there will be an enormous and rapidly increasing amount of plutonium wherever electrical power is generated. This poses the threat of more and more countries, large and small, with the capability of producing nuclear weapons.

Note that our use of fuels and pesticides, and their ultimate effect on our supply of atmospheric oxygen, are just two major contributors to the problem of air pollution. Any study of the future of our mantle of air, its interactions with the oceans and plant life, and of future climate, must consider these inter-relationships as a dynamic system.

In the days of river transport, when waterwheels gave power, and even the railroads followed the rivers, where else would one put mills and factories and build cities but in valleys. But now we realize that these valleys are the worst possible places from which to disperse the aerial wastes of our homes and factories. We should have put them on the tops of mountains. As man increases his ability to control his environment it becomes more and more necessary to take care not to do something foolish. As an extreme example, Dr. Frtiz Zwicky of Caltech, has remarked that if we try to harness the tides as a source of power we may eventually slow down the rotation of the Earth and change the length of the day.

Consider weather control. The cloud systems and oceanic currents in the atmosphere, which we are only beginning to understand through study of satellite photographs, are the final determinants of weather on the Earth. A satellite in polar orbit can examine every point on the Earth twice a day. Any attempts to increase rainfall in one part of the country may have negative effects in another part of the country, or of the world. Consider the legal implications of diverting a hurricane from Miami, for example, and having it hit Bermuda. Even when you give one Iowa farmer some rain you may verl well ruin the gate at the County Fair. From time to time it has been suggested that the Arctic ice-cap might be melted -- either by diverting warm ocean currents or by depositing a heat-absorbing dust on the surface of the ice. This is a feat that is within our power to do today. But what might the consequences be? In addition to making the Arctic a navigable sea, which might please the Russians and Canadians, something worse could happen. A study made at RAND has shown in some detail how the ice-cap contributes to the heat budget of the Northern hemisphere, and indicates that if the cap is removed the climate of Northern Canada would be affected in such a way that we might see the start of a new Ice Age, with the formation of glaciers near Hudson's Bay. How do we reach such conclusions? With the aid of the computer it has been possible to calculate the implied changes in the Arctic weather and to run the clock ahead hundreds of years to see what will happen. And unless there is an error in the starting assumptions, it seems likely that we would not want to fool around with the ice-cap. To illustrate how delicate a mechanism we are dealing with it turns out that the ice-cap is generally about 10 feet thick, although it sometimes is only about 5 feet thick in mid-summer. Observe that this normal variation represents a 50per cent change in thickness of the ice. It might not take much to go the rest of the way.

You will find that most meteorologists and climatologists take a very conservative view of weather modification. They are only too aware that some act of man may begin a process that could not be reversed and that might have unpredictable consequences for life on the Earth. And just to make life interesting, there are those who believe that our continuously rising use of hydrocarbon fuels is gradually overpowering the ability of the oceans to recapture the chemicals, and predict a slowly rising temperature and eventual loss of both polar ice-caps -- and the flooding of low lying coastal plains and cities. So, air pollution -- if it doesn't kill us directly, may gradually turn the Earth into a swamp.

The future role of the computer is a familiar topic of speculation. Although this instrument is a relative newcomer to the field of technology, its growth has been spectacular. Comparing today's computer with a 1953 machine, we find it is ten times smaller, a hundred times lighter, and makes calculations 1000 times as fast. And the amount of computer power in the United States has been doubling every year in recent years. With this universal tool becoming so easily available and cheap, many persons predict a drastic change in family life. The man of the house may be able to do much of his work at home, with a computer console in his study. The housewife may be ordering groceries and other amenities from central stores linked to the home electronically. The children may receive much of their schooling at home, either by television or with personal teaching machines and programmed instruction.

While the picture of the family sitting at a computer or TV or message center may be carrying togetherness too far for some persons' taste, it will undoubtedly have some beneficial effects. We are already concerned about the declining integrity of the family and its social consequences. We are already concerned about the loss of status of parents who are no longer the traditional source of wisdom for the next generation. The truth is that most parents today do not have the knowledge their children need. In fact, the educators tell us that if we are not to waste a critical period in the life of our children, when they learn fastest, we shall probably have to get in their education at about 1 year -- at a time when they are usually closest to their parents, especially the mother.

We can expect enormous changes in education -- not only in techniques but in its impact on our whole society. Projecting population trends forward, we can expect college enrollment to rise from 3 1/2 million in 1960 to between 13 and 16 million in the Year 2000. If the size of our present colleges only doubles, we will need 1,000 new 4-year colleges, and 2,100 new junior colleges by the Year 2000. Capital expenditures implied by this amount to about $100 billion, and annual expenditures would rise from $10 to $40 billion.

Education will not be something one gets like the measles, or passes through, like childhood: it will be an on-going thing. Our universities already have what they call "centers for continuing education" and so-called "extension" courses reach out into the adult community. In Los Angeles, one in every four adults enrolls in an extension course sometime each year -- and there are more extension students than there are regular students. The proportion of the population that will have had a college education will pass the two-thirds mark in 1980, and continue to rise. Colleges will become a place for retraining, as adults, trying to keep pace with advancing technology, are forced to learn to do 2 or 3 or more kinds of jobs during their working careers.

One member of General Electric's TEMPO group has predicted that man will devote a third of his life to study, a second third to traveling, and the last third to profit from the fruits of his labor.

It is now technically feasible to put satellites in orbits (stationary with respect to the Earth's motion) and to store thousands of videotaped programs aboard each satellite, so that anyone on the Earth dialing the proper number could receive on his personal TV set any high-school or college course, or engineering training course, or entertainment movie. All that means is that the Earth-Satellite communication system will not be just one program selected by a TV network, but one that anyone on Earth can use to obtain any of thousands of possible programs at any time.

Dennis Gabor, the British scientist and author of Inventing the Future, says that civilization faces three grave dangers: nuclear war, over-population, and leisure. He remarks that while the majority now works for the minority, the opposite will soon apply: a small number will create for the majority of consumers. Humanity will be divided into two parts: one-fifth engaged in the continuous process of creation, and four-fifths working a minimum amount of time and confronted with leisure they will not know how to use. Some people argue that a very small percentage of this labor force will soon be able to produce all the goods and services our society needs. This is probably nonsense. The argument would be that the average family income in 2000 depending upon the rate of growth assumed, would be somewhere between $15,000 and $27,000. Now, even at that higher figure, you will probably agree that people won't be sitting around trying to think of ways to spend their money. And only when that is the case will workers increase their leisure time substantially.

We all know people with twice our annual income, and you might expect them to work half the time and enjoy our living standard -- plus a lot of leisure. But no one seems to be making that choice. So, by the Year 2000, the average work week may have declined somewhat, but probably not much below 35 hours. All this really says is that people will accept and work for a very much higher income before they will start loafing.

Conflicting arguments center upon the various likely modes of transportation in the Year 2000. Some predict more trains -- high speed, air-cushioned, medium haul lines. Others predict the demise of the railroad before 2000. Some persons, recalling that in 47 B.C. Caesar barred wheeled vehicles from Rome during daylight because of traffic congestion, expect the automobile to be banned from the city of the future. Others envision a doubling of our automobile population by the end of the century, with most of the vehicles electric powered. Short-range electric cars are already in use -- mostly in plants where noise and noxious fumes must be avoided. The Federal Power Commission reports that about 1000,000 units are now in use in American plants. In Britain, there are 40,000 electrically powerd delivery vehicles on the street. (L.A. Times 2/26/67.)

Still another version would have personal transport vehicles publicly owned, coin-operated, much like inter-city trailer rentals. The analogy is drawn to the World War II British air base, where bicycles were parked at convenient locations, freely available, and redistributed optimally every day. Why not do something like this with cars? The Russians predict a wider use of remote powered vehicles. They envision a "sleeping" network of semi-conductors to provide power to vehicles, that comes to life when activated by a vehicle and then conserves power by becoming dormant again.

The city of the future will probably be not quite as fantastic as some of the wilder planners tell us. But that they will be different from what we know today is certain. The vice-president of the Canadian Refrigeration and Air Conditioning Association has suggested that Toronto be given a Caribbean climate by tethering plastic domes a thousand feet above the city, held up by warm air currents, capturing sunoight, etc. He sees orange trees in back gardens, roses in December.

We will very likely do something about the fact that one-third of most cities consist of roads and streets -- and rising land-values may make underground freeways and parking economical. The present flight to the suburbs is consuming the open spaces around cities at the rate of a million acres a year. At the same time, the central city is becoming more and more a ghetto peopled by poor minorities, unable to escape and unable to support urban progress with taxes. We are going to have to tear down and rebuild many of our cities and not by slum-displacement urban renewal as in the past. By the Year 2000 we may see a proliferation of satellite cities of moderate size and a decline of giant urban concentrations. Even under the pressure of population growth, the city of the future is more likely to feature self-sufficient high-rise structures and open spaces than the urban sprawl that characterized city growth in the last half-century.

Some of my colleagues at RAND are very much concerned about privacy in the world of 2000, when our information processing, storing, and retrieval systems will have become extraordinarily cheap and wide-spread. A few months ago, the Government was considering centralizing its computer facilities, and Paul Baran of RAND testified against such a move. As we go through life we leave behind a trail of records. Starting with our birth certificate, we accumulate medical records, educational data, IQ test scores, personality profiles, military records, a social security file of employment, a driver's license with traffic citations, and possibly police records. As adults we have charge accounts, bank credits, tax records, and so on. The list is almost endless. Today these records are widely dispersed and generally inaccessible without a great deal of effort. In the future it is possible that the information will be centralized and cheaply available. Unless appropriate precautions are planned now, an unscrupulous person would be able to turn up scandal or defamatory information (where it exists) with comparative ease. Until now, a person could escape his past. In the future, that may be impossible. How much will we value privacy in 2000?

The other day a professor of law, and law librarian at New York University, predicted that an "author" might soon sell his work to an information system run by the government, industry, or libraries -- rather than to publishers. He would be paid, not for the number of copies printed, but for the number of times his computer-stored material was used. The professor expects future generations to be less interested in traditionally bound books. (N.Y. Times 2/11/67). But books on microfilm are already fairly popular, and to bring information to even more millions of persons in the developing countries may call for even more imaginative schemes. David Hays, a linguist at RAND, has been quietly proposing that someone give him $200 million so that he could set up a thousand new libraries around the world, each with a million "books." The idea for providing the under-developed world with a billion books rests on technology that is already here. The National Cash Register company has devised a way to put as many as 2500 pages of printing on a 4 x 6 card -- it is called ultramicrocard. A 200-power magnifying reader, costing $200, is needed. But imagine having a million-book library in a filing case four feet high and six feet long. If its catalog consisted of bound volumes -- say 80 volumes of 1000 pages each -- it would take up more wall space than the card file.

But the need is great. Central Africa has 1200 higher educational institutions for 150 million persons, and only 2 million books. Most of the world has fewer than one book per five persons in its libraries; we have about 3 per person. It is safe to say that libraries of this sort will be commonplace in the Year 2000 -- in this country, as well as abroad. Earlier this year, the director of the New York Public Library revealed that nearly 2 million of its books -- almost all of those published after 1870 -- are in an advanced state of deterioration.

The Wall Street Journal recently described the library of the future -- of the year 2000 -- as a "computer-run warehouse." The patron would go into a cubicle where at the push of a button he could call forth tapes, recordings, films, and print-outs of books. At the library -of-the-future meeting earlier this month, I heard Ray Bradbury, the well-known science fiction writer react to this suggestion. He is a man who, if he hasn't seen the future, has invented it. And this sort of library is not for him. He threatens to short-circuit the machines. He wants a library to be a place where you can smell and handle the books.

What can we look forward to on the international scene in the Year 2000? Most analysts -- including the Delphi group, the Commission for the Year 2000, Herman Kahn, and a number of European futurists -- believe (first of all) that the likelihood of a major war between now and 2000 is small, and (second) that we may be entering an era of stability -- a "Hundred Years' Peace." It is difficult to classify and rank the futures of the many political elements that make up the world, but let me try to say just a word about some of the more important. Many persons believe that the United States will withdraw from its position of "policeman of the world" and may become once more an isolationist, Western Hemisphere centered nation.

There are two schools of thought on China. One, exemplified by Herman Kahn, feels that too many persons have confused size and power, and that China's enormous population will remain a handicap to its industrial progress and political influence. Others argue that by the end of this century, China, Indonesia, and Brazil will all have risen to positions of power. A subset of this school believes that China will withdraw from international competition and, like the 19th century U.S., consolidate its internal gains -- economic, political and scientific: in essence, they predict a rebirth of historic Chinese self-interest and disdain for the rest of the world.

Japan is expected to move from a fifth or sixth-rate power in population and national product, to third rank in gross national product and second in per capita income. What of the two Germanys? East Germany by the Year 2000 may have become a stable, self-sufficient nation with a future. West Germany, still regarded as a threat by most of Western Europe, will rank fourth in the value of its national output, but will be close behind Japan in income per capita. Both Africa and Latin America will be wracked by political unrest in the coming decades, postponing until beyond the Year 2000 the achievement of the social revolutions and national autonomy that will permit steady economic advance.

Such generalizations are probably meaningless, unless supported by detailed analyses of individual countries. Because that is impractical to do here, suffice it to say that there is a higher probability of peace than of war, and an even chance that some kind of world government will be evolving toward the end of this century.

In the past, and not too far in the past at that, man regarded Nature and his environment as more often than not an adversary. It was the sometimes benign sea, from which he made a living, that could smash his vessel and batter his harbor. For the farmer, it was the warm sun, the gentle rain, and easy breeze, that might scorch his crops, flood his rivers, uproot his orchards, and carry the topsoil into the next county. All these events occur today, here and in distant lands. But there is a difference. Not only do we have swift means of rescuing the stricken -- not always all, or soon enough -- but we can gradually learn to prevent or alleviate many of the "natural" disasters of the past. The panorama of future possibilities that I have laid before you does not represent a world that you will have whether you want it or not. Most of the developments I have described, and the circumstances they imply, are man made. How much open space, park, and wildland; how much clean air and water ; what kinds of schools and cities and means of transport; even the kind and amount of personal freedom and privacy you will have will depend upon decisions you may be called upon to make in the years to come. Decisions being made today directly affect the future. Some of today's decisions have a statistical probability of affecting someone we have never seen in distant lands, and may never see -- in future generations.

Rational man must view the future as subject to his control. And each of you bears some responsibility for the kind of world you and your children will have in the Year 2000.

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The author, who is Assistant to the President, Communications, presented this paper to the Chevrolet Academy at Wayne State University, Detroit, March 2, and March 23, 1967.

SUGGESTED PROCEDURES FOR SUBUNIT: THE SIMULATION

Other subunits have given detailed instructions for the teacher; this one will be in the nature of advice.

Simulations do several things: they add to student interest in the course, they enable students to experiment with and investigate social phenomena, they point up the complexity of human affairs, they review facts, principles and concepts learned, and they reinforce learning. For all of these reasons, it is strongly urged that a simulation of some sort be used as a "capstone" to the entire unit on conflict.

My colleagues and I experimented with several types of simulations with regard to this unit; let me mention two. First, a variation of an inter-nation-type simulation, devised for us by an able political science doctoral candidate at Stanford University. This simulation was flexible in the extreme, and can be considered in many ways highly successful. However, the success was tempered by a few cautionary considerations: it was highly mathematical, and this caused a good deal of pain to many students. It was also (generally as a result of its mathematical character) highly complex, and placed the students under a good deal of time-pressure (not in itself unrealistic). It also caused negative responses in a sizeable minority of students, generally for the reasons noted above. We came away from our experience with several things in mind: 1. adequate time must be set aside for such a simulation (3 to 5 weeks, in all probability); 2. the teacher should feel easy with math; 3. an extensive, detailed introduction is aboslutely necessary; 4. the fewer classes undertaking a simulation under the direction of one teacher at a time, the more successful the experience will be; 5. average students, and those with less motivation (and interest) in school need additional preparation and encouragement, or they may tend to "tune out". The teacher should be prepared to spend much more time than usual checking calculations and preparing for the next simulation session.

The above remarks should not be regarded as negative, but they should be kept in mind. Community interest should not be forgotten, either; many parents are not accustomed to such teaching techniques, and the relevance of simulations should be carefully explained. Enclosed is a statement given to parents at our "back to school night", explaining simulations.

This inter-nation simulation was tried in twelve eleventh-grade United States History courses, and one ninth-grade social studies course. We found varying degrees of success in ten of the twelve classes, where a total of nine sessions over a period of three weeks was devoted to the simulation; in two classes, we admitted failure (teachers must be prepared for virtually anything when dealing with such an open-ended exercise). The ninth-grade class saw a qualified success; the limiting factor here was time. We found that a minority of students -- about 25% -- became highly motivated, some virtually to the point of conflict outside of class themselves; about half the students showed interest of one sort or another; something less than a quarter of our non-tracked students showed lack of interest in varying degrees -- much of which, we found, stemmed from the fact that our preparation was not sufficiently adequate before beginning the unit.

Eight ninth-grade classes, also studying the conflict unit, played the Foreign Policy Association-devised "Dangerous Parallel," a less flexible simulation but one requiring far less mathematical ability. One special class, a seminar on war and peace composed of tenth, eleventh and twelfth grade students, also played the latter game. We found that it engendered more interest, and that it was relatively successful.

Our experience and evaluations showed that the simulations generally substantiated our expectations (outlined in paragraph two above). This, we found, was an ideal method of checking the effect of our teaching about conflict, and we highly recommend it for others considering using this unit. There are many commercial simulations available that would suit the needs of this unit: for a list of them, and a discussion of simulations, see the indispensable Foreign Policy Association School Services booklet New Dimensions, volume I no. I, "Simulation Games for the Social Studies Classroom."

Just a few hints about simulation use with regard to this unit. It is fairly important that teachers give as much latitude to students in the simulation as is feasible, including choice of decision-making position, if at all possible. We found that many very able students were not willing to take leadership positions, and that many students usually regarded as indifferent in the classroom made splendid leaders. Appended is a questionnaire we used in attempting to fit students into positions they felt they would desire.

The teacher should intrude as little as possible in the simulation itself; he should keep track of time, but let the simulated world unfold as its leaders wish. Some teachers will find that the students will act as the teachers would not have them do in real life; but any interference -- even if a young Hitler or Genghis Khan arises! -- should be resisted at all costs. If students feel that they must conform to the predispositions of the teacher, the whole purpose of the exercise is negated. This point cannot be stressed too strongly. Any comments the teacher may wish to make should be saved for the "debriefing."

At the end of the exercise, a debriefing is absolutely essential. Here the students may be led to discuss what they saw in the simulation (or what they thought they saw: perception and misperception play a central role, and students will be quick to see this); how the game is similar to (and different from) real historical situations, the role of the individual leader, personality differences -- the entire range of concepts studied in this unit on conflict. As much time as might be fruitful should be set aside for the debriefing. And the instructor should here try to smooth any ruffled feathers -- and there will be many. Above all, students should not finish this subunit harboring animosities toward any other student as a result of the simulation interaction. During the play of the game, the teacher should keep close watch on what is happening, and he should keep extensive notes for use during (not before!) the debriefing.

Lastly, the teacher should be prepared for virtually any alternative actions to be chosen by the students, and should not be dismayed. Actually, this will provide rich material for discussions and other analytical and evaluative exercises. I'm reminded of one class, where the peacefully-inclined leader of a "United States"-type country began a careful, cautious de-escalation using the Osgood process (GRIT). Enlisting the aid of the UN officials, the newspapers and several other nations, she appeared to be heading toward a more peaceful world. I was, at the time, the only person outside her opposing nation to know that the latter nation was hatching a plan to take control of the world -- a devilish but superbly-thought-out series of three alternate strategies. Our young leader was crushed, stunned, shaken when the plot unfolded, but it provided splendid opportunities for discussion in the summary and debriefing later. And her comment was seconded by many members of the class when, at the conclusion, she mused thoughtfully, "I never realized how complicated and difficult international affairs could be. It takes more than just a desire for peace in the world, doesn't it?"

A simulation, then, is a most useful method of enabling the students to act affectively, not merely cognitively. We heartily recommend its inclusion in the unit on conflict.

SANSIM PARTICIPANT QUESTIONNAIRE

name

section ____ period ____

You are about to take part in an international relations simulation. You will be given some choice as to what size country you will be in, what position you will hold, and so on. Please indicate below what your preferences are. We cannot guarantee that you will get your first choice, but we will do our best. After each question, put "1" for your first choice, "2" for your second, and "3" for your third. You may list up to 3 choices.

POSITIONS AVAILABLE: I would prefer to be --

a head of state/government (president, prime minister, etc.) ____

External decision-maker (secretary of state, minister of foreign affairs) ____

Defense decision-maker (secretary of defense, war/navy/defense minister) ____

Internal decision-maker (home minister, secretary of interior, education minister, minister of economics, etc.) ____

Opposition decision-maker (leader of the opposition party; communications and propaganda minister in a one-party state) ____

International Organization official (United Nations, NATO, WTO, SEATO, OAS, Universal Postal Union) ____

Newspaper reporter (you will be running a classroom newspaper) ____

PLEASE DO NOT WRITE IN THIS COLUMN

CDM ____	IDM ____
EDM ____	ODM ____
DDM ____	C&P ____
sEDM ____	IO ____
A ____	PR ____
B ____	MSG ____
C ____	
D ____	
E ____	

SIZE OF NATION: I would prefer to be in a

Large Nation ____

Small nation ____

Middle-sized nation ____

No preference ____

TYPE OF NATION: I would rather be in a

developing, mature country ____

developing ____ undeveloped ____

no preference ____

WEALTH OF NATION: I would prefer to be in a

rerich country ____ poor ____ no pref ____

POLITICAL BACKGROUND: I would be interested in being in a simulated

one-party state (dictatorship ____

multi-party state (democracy) ____

no pref ____

I have had experience on a newspaper: yes ____ no ____

I have had experience in student gov't: yes ____ no ____

SOCIAL STUDIES SIMULATION GAMES

Educational "games" are a relatively new technique used in teaching Social Studies, and we have recently begun using a few of these at San Ramon High School.

What are simulations? Simulations -- some people call them games -- are operating models of physical or social situations. Simulations have long been known in the military field; the earliest war game is of course chess. Modern naval and military staffs have considered war gaming a necessary aspect of planning strategy -- the Defense Department includes a daily-operating Joint War Games Agency. Industry, too, has been using techniques of simulation for some time now; such firms as Boeing, North American, the major airlines -- even the National Aeronautics and Space Agency has been putting future astronauts through simulated exercises.

What are the uses of simulations? Simulations are used to enable human phenomena to be studied by the student in a near-laboratory situation. It is the nearest approach the social sciences can make to physical-science-like scientific study of human action. Simulations are able to give the student a chance to manipulate, to experiment with, concepts and principles which he has studied in a history or government class. Once we accept the fact that one of the primary reasons for history, government, geography and other social studies courses is to help the students become good citizens of this country, and that a necessary part of citizenship is thoughtful decision-making, the value of simulations becomes very apparent. We find that many students, even after taking a solidly-based history course, are unable to fathom the complexity, the difficulties, the ramifications of decisions which must be made. Hence, we feel that a judicious inclusion of some form of logical practice in decision-making is a help in outlining, to the modern student, the uses, the relevance, of the study of their history and their society.

How are simulations used? Specifically, at San Ramon High School, we have used the following: some of our World Problems courses have used a game centered around propaganda, to give the student practical practice in recognizing propaganda techniques. Some have been using a simplified inter-nation game (Dangerous Parallel, devised by the Foreign Policy Association) in learning some of the simple necessities for consideration before a government makes a foreign policy decision (the game is based on the Korean War, just before Chinese Communist involvement). Some have used the very simple Prisoner's Dilemma, and its variations, to discover some of the compelling principles of action and reaction, trust and mistrust, perception and misperception -- all very real aspects of decision-making throughout history, but -- until recently -- not dwelt on in classes. In United States History courses here at present, we are using an inter-nation simulation of some complexity, wherein classes are divided into five countries, each country has five decision-makers, the countries are given various attributes, ideologically, militarily, economically, and so on, and the students perform as would national decision-makers, in running their simulated world. With the help, advice, and encouragement of the Math department, and also the Business department, the results of the decisions which the students have made are determined by our shared-time tie-in with the IBM 360 computer.

What value have simulations? We find that they enhance student interest in social studies courses; that they enable students to experiment with the principles and ideas which they have learned; that they underscore the complexity of human phenomena; and that they reinforce learning. The department feels that, judiciously used, simulations have a place in social studies education.

SUGGESTED PROCEDURES FOR SUBUNIT: SUMMARY

At the conclusion of the unit on conflict, or after using the chosen subunits, the teacher will probably wish to summarize all the emphasized concepts learned, prior to the final evaluation. Since this must, of necessity, be a flexible, tailored process, few specifics will be given here. It has been found, however, that a useful technique is the use of a reading, or series of readings, which might point up many of the internalized concepts.

Thus, the brief reading on research findings is appended. These have been extracted from Dr. Raymond Tanter's unpublished manuscript "Toward the Application of Government Supported Social Science Research to International Security Planning." Tanter, having combed through a number of research projects, abstracted some of the findings in his paper. He feels that "this knowledge might be used to aid in forecasting and planning tasks", but it should also prove useful in giving a broader outlook to students regarding the relevance of all of the social sciences.

The findings are really very self-explanatory. The teacher might attempt to elicit examples of the findings discovered in the Dilemma sub-unit, or during the course of the simulation, or from the experience of the students. Some of the findings will be very obvious to students, others may be so commonly accepted that students seldom have thought about their importance (10b, for example). Each should provide some food for thought; number Ic, for example, is relevant to current campus unrest; 2 can help to explain unrest in the developing areas (attached is a list of annual per capita national incomes for various nations of the world) -- and it might indicate something about Shays' rebellion in our own history, or the ante-bellum American South, or the rise of Populism, to give some other possible examples. Item 4 might help explain some reactions to the recent civil rights progress. Item 5 can be seen at work in labor-management relations (and can be simulated very easily by the use of Dilemma). Will item 3 explain Spain, or the Greek junta, or Nazi Germany? Many other examples will occur to the teacher as well as to the student.

RECENT RESEARCH FINDINGS RELEVANT TO INTERNATIONAL POLICY PROBLEMS

In addresses given to the Woodrow Wilson School of Princeton University, the Foreign Service Institute School of Professional Studies seminar on Computers and Foreign Affairs, and the Douglas Aircraft Seminar on International Environmental Projections, all in 1968, Dr. Raymond Tanter, of the Institute for Political Studies, Stanford University, pointed out that there are many agencies which have produced research on international affairs, but that many of the findings are not available to government, scholars, and the general public. He went on to list some of these important, but unpublicized, tentative research findings. Some of them are listed below.

* * *

1

The presence or absence of past turmoil -- that is, riots or demonstrations, and the like -- can be predicted in 92 of 119 nations studied.

Social-psychological characteristics of a society, such as relative deprivation of groups in a society, are related directly to the likelihood of turmoil.

Political system attributes, such as the capacity of a governmental regime for retribution, tend to inhibit the likelihood for internal war (civil war or guerrilla warfare). But inconsistently applied force, and increases of force as a result of strife, are associated with increased strife later on.

For larger and more developed countries, economic improvement followed by relative decline is related directly to domestic violence.

* * *

2

Countries with annual per capita incomes exceeding $700 tend to have very small levels of domestic violence; those below $100 tend to have very little violence; those between $100 and $700 tend to have the highest level of violence.

Fifty percent of the domestic violence across nations can be predicted by a combination of inequality of farm land distribution and relative size of the agricultural labor force; in non-agricultural countries, land distribution is unrelated to violence, but in mainly agricultural nations violence and inequality are related directly.

* * *

3

Stable countries with a high potential for instability have regimes which are seen as legitimate. Countries tend to be stable if the regimes' authority pattern is similar to the other authority patterns of the society (such as the family, church, bar associations).

* * *

4

Effectiveness of non-violent campaigns in sustaining the groups and achieving their objective appears to be a consequence of the implicit threat of actual violence

5

In conditions where both adversaries in a controversy possessed threat capability, there is relatively little use of threat; this self-imposed restraint may be based on the prospect of retaliation.

When conciliatory bargainers are paired with each other in negotiations, the prospect for mutually satisfactory outcomes are highest; when belligerents are paired, outcomes are somewhat lower; but when a belligerent and a cooperative bargainer are paired, outcomes are lowest.

* * * * *

6

The closer nations are to each other economically, politically, and socially, the more aligned they are in United Nations voting and the less diplomatic and military conflict they have. (The actual alignment and conflict can be predicted successfully.)

Transactions between nations such as trade can be predicted well on the basis of their attributes such as their size and energy consumption.

Conflict within nations is generally unrelated to conflict between them at one point in time.

* * * * *

7

Parties in conflict during the abatement of an international crisis tend to cover their retreats from violent deeds with a barrage of complaints, protests, accusations, denials, rejections, warnings and threats.

There tends to be a gap between Mainland China's verbal protests and threats as contrasted with their actual military behavior -- China tends to follow a conservative military strategy and tends to back down under strong demonstrations of force.

* * * * *

8

When simulation-experiments were conducted on the effect of nuclear proliferation on alliance cohesion, it was found that alliances tended to fragment as nuclear weapons were spread.

When simulation-experiments were conducted to simulate the outbreak of World War I, remarkable similarities were found in the relationship of perception of threat and expressions of hostility among key decision-makers prior to World War I and those in the simulation.

* * * * *

9

On the basis of anatomical and psychological differences between peoples of various cultures, specific predictors have been confirmed about how the face, hands, feet, legs, and overall posture indicate deception between parties in communication.

* * * * *

10

During disasters, Americans tend to use the telephone as a means of showing concern rather than for acquiring or disseminating information; other cultures may not have the same need to show concern, which may cause confusion in a culturally mixed situation.

There are patterns of openings and closings of conversations by Americans which may be generalized cross-culturally; if not, confusion could result from assuming that the openings and closings are universal across cultures.

* * * * *

EXAMPLES OF ANNUAL PER CAPITA NATIONAL INCOME

THE WORLD	$ 493
UNITED STATES	2893
CANADA	1825
MEXICO	412
COSTA RICA	353
EL SALVADOR	236
GUATEMALA	281
HONDURAS	194
NICARAGUA	298
PANAMA	425
ARGENTINA	740
BOLIVIA	144
BRAZIL	217
CHILE	515
COLOMBIA	237
ECUADOR	183
GUYANA	248
PARAGUAY	186
PERU	218
URUGUAY	537
VENEZUELA	745
BARBADOS	361
CUBA	310
DOMINICAN REPUBLIC	212
HAITI	80
JAMAICA	407
PUERTO RICO	959
TRINIDAD & TOBAGO	501
AUSTRIA	970
BELGIUM	1406
DENMARK	1652
FINLAND	1399
FRANCE	1436
GERMANY, WEST	1447
GREECE	566
ICELAND	1870
IRELAND	783
ITALY	883
LUXEMBOURG	1498
MALTA	429
NETHERLANDS	1265
NORWAY	1453
PORTUGAL	351
SPAIN	594
SWEDEN	2204
SWITZERLAND	1928
UNITED KINGDOM	1451
ALBANIA	315
BULGARIA	407
CZECHOSLOVAKIA	804
GERMANY, EAST	1240
HUNGARY	701
POLAND	710

RUMANIA	$ 353
USSR	928
YUGOSLAVIA	406
AUSTRALIA	1620
NEW ZEALAND	1706
ALGERIA	195
LIBYA	636
MOROCCO	174
SUDAN	90
TUNISIA	179
U A R	130
DAHOMEY	60
GAMBIA	75
GHANA	245
GUINEA	60
IVORY COAST	188
LIBERIA	148
MALI	55
MAURITANIA	106
NIGER	78
NIGERIA	63
SENEGAL	149
SIERRA LEONE	123
TOGO	82
UPPER VOLTA	40
BURUNDI	45
ETHIOPIA	42
KENYA	77
MADAGASCAR	80
MALAWI	38
MAURITIUS	215
MOZAMBIGUE	40
RWANDA	45
SOMALIA	45
SOUTHERN RHODESIA	206
TANZANIA	64
UGANDA	77
ZAMBIA	174
ANGOLA	55
CAMEROON	104
CENT. AFR. REP.	123
CHAD	60
CONGO (Brazza.)	120
CONGO (Dem. Rep.)	66
GABON	333
BOTSWANA	55
LESOTHO	50
SOUTH AFRICA	509
CYPRUS	623
IRAQ	193
ISRAEL	1067
JORDAN	179
KUWAIT	3184

LEBANON	335
SAUDI ARABIA	165
SYRIA	156
TURKEY	244
YEMEN	75
AFGHANISTAN	70
BHUTAN	50
CEYLON	130
INDIA	86
IRAN	211
NEPAL	66
PAKISTAN	89
BURMA	56
CAMBODIA	112
INDONESIA	85
LAOS	50
MALAYSIA	250
PHILIPPINES	219
SINGAPORE	508
THAILAND	105
VIETNAM (S.)	113
CHINA (CPR)	80
CHINA (Taiwan)	185
HONG KONG	291
JAPAN	696
KOREA (N.)	180
KOREA (S.)	88
MONGOLIA	190
NORTH AMERICA	2793*
LATIN AMERICA	344
EUROPE	1069
AFRICA	123
ASIA	128

*excluding Mexico, which is included in the Latin American category

Source: UN Yearbooks

Figure I, Summary: RESEARCH FINDINGS item 2